

STATUS OF THE FAMILY FARM: Second Annual Report to the Congress. National Economics Division; Economics, Statistics, and Cooperatives Service; U.S. Department of Agriculture. Agricultural Economic Report No. 434.

#### ABSTRACT

Farm production and sales are becoming more concentrated; 125,000 farms accounted for half of all farms sales in 1974, which required 205,000 farms a decade before. The average age of farm operators steadily increased from 48.7 years in 1945 to 51.7 years in 1974, as fewer younger farmers entered farming than older operators retired or sold out. Changes in the relationship between the farm and marketing sectors forced farmers to consider forward contracting and farmer-to-consumer direct marketing. About \$2 billion were disbursed in the 1978 farm programs, but most of the benefits went to the larger farms.

Keywords: Family farm, Farm structure, Farm programs, Agricultural markets, Forward marketing, Direct marketing, Cattle feeding.

## FOREWORD

The Food and Agriculture Act of 1977 directs the Secretary of Agriculture to report annually on the current situation and trends for family and nonfamily farming operations. The reports are to analyze the effect of Federal policies on the farm sector and provide other information relevant to legislative and policy decisions directed toward promoting a family-farm system of agriculture.

This is the second annual report. It does not repeat information in the first report, but presents new information and analysis augmenting it.

The first report <sup>not in CC</sup> described the structural characteristics of the farm sector, including major trends and the underlying forces. It delineated the definitional and conceptual problems and identified data and information deficiencies in treating family farms in a policy context. A comprehensive research agenda was suggested, including research viewed as essential to Congress in considering future legislative and policy decisions relevant to family farms and the structure of the farm sector.

There has been a revival of interest in the structure of agriculture (and family farms) since the first report was prepared a year ago. There is a growing recognition of the dynamics of the farming system and increasing concern about whether many of the rapidly occurring changes are desirable. There is also a growing awareness that the current economic and social problems of the agricultural sector are different from those that have been the focus of public policy for many years. A general agreement on the nature of the problems, let alone the appropriate solutions, has yet to emerge.

The U.S. Department of Agriculture, over the past year, has been addressing the farm-sector issues in several contexts. Secretary Bergland, in a major policy speech early in the year, elaborated his concerns about the future directions of agriculture. He encouraged a broad public dialogue to examine the structure of agriculture and whether policy changes should be considered to influence that structure. He proposed that this national dialogue attempt to delineate the problems and move toward solutions.

Events of the past year underscore the need for additional information on all aspects of the structure and organization of agriculture, including family farms. This report carries results of some research further treating these issues. Other research efforts are underway in the Department; some to be completed soon, while others are of longer duration.

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## SUMMARY

The structure of the U.S. farm sector is changing. Farm numbers are declining, farm sizes are increasing, and farm production and sales are becoming more concentrated; 125,000 farms accounted for half of all farm sales in 1974, which required 205,000 farms a decade earlier.

The average age of farm operators steadily increased from 48.7 years in 1945 to 51.7 years in 1974. Only slightly more than half the older persons leaving farming for retirement or other reasons between 1964 and 1974 were replaced by young farmers. A net of 930,000 farmers who were 55 years of age or older in 1964 had left farming by the time the 1974 Census of Agriculture was taken, while only 475,000 persons under 35 had begun farming.

Partnerships and corporations accounted for only 10 percent of farms in 1974, but being larger they sold nearly a third of all farm products and farmed a fourth of the land. Corporations comprised a very small number of farms, but they accounted for 18 percent of the farm products sold, an expansion from their 14-percent share in 1969.

Changes in the structure and organization of both the farm and the marketing sectors since the fifties have altered the relationship between them. Both sectors have become larger and fewer in number. Country buying stations and assembly point markets have dwindled as both large farmers and buyers have chosen to bypass these traditional farm markets in favor of more direct-marketing methods.

The 1978 farm program increased net returns to participating farmers, but the benefits favored larger producers because payments were related to individual farm size and acreages planted. About \$2 billion were disbursed in program payments, the largest amount since 1973. Almost half of the payments went to only 10 percent of the program participants, those with the largest farms. In contrast, 50 percent of the farms--those with the smaller units--received only 10 percent of the payments. Higher commodity prices as a result of acreage controls increased returns by about another \$900 million.

The cattle-feeding industry typifies the evolution that has taken place in U.S. agriculture. Over 61 percent of the fed cattle marketed in 1964 were from 223,000 feedlots with a capacity of less than 1,000 head. Small-feedlot numbers decreased to 130,000 and accounted for less than a third of the fed cattle marketed in 1977.

# **Status of the Family Farm:**

## **Second Annual Report to the Congress**

### INTRODUCTION

The structure of the U.S. farm sector continues to change. Farm numbers are declining and farm sizes are increasing. Escalating capital requirements are presenting ever greater barriers to new entries into farming. Fewer younger people are entering farming than older operators are leaving for retirement or other reasons. Changes are requiring farmers--particularly small farmers--to consider alternative marketing approaches. Government farm programs are increasing net returns to participating farmers, but a large share of program benefits go to large producers because payments are related to individual farm size and acreages planted.

This report describes the structural characteristics of the farm sector, analyzes major trends and underlying forces, and discusses why the changes are occurring and where they may lead. Data used in this study were derived from a variety of private, university, and Government sources, including the Censuses of Agriculture and Population (31, 32, 33). 1/

### TRENDS IN SELECTED STRUCTURAL CHARACTERISTICS

Forces that provide incentives for the moderate to larger size farms to grow further are bringing about structural changes in the farming sector. The number and size of farms, the form in which farm businesses are organized, and the changing patterns of entry into and exit from farming are among the more commonly quoted manifestations of structural change.

Farm structures have evolved over several decades, marked by declining numbers of farms. Farm size has increased, with production concentrated on fewer farms. The average age of farm operators has increased as fewer people under 35 have entered farming than older operators have left for retirement or other reasons. Many of those under 35 who take up farming do so as part-time operators of small farms, with their primary income from nonfarm sources.

These and other continuing structural changes in the farming sector are fundamentally altering the role, character, and problems confronting the family farm of today. These trends imply further concentration of agricultural production via continued

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1/ Underscored numbers in parentheses refer to references listed at the end of this publication.

growth of larger family farms. These farms will generally still be family units, but a farm sector where fewer than 100,000 farms produce over half the output is different from the farm sector of the thirties and forties. Thus, the objectives and needs for public policy for the farm sector may have to be reevaluated to ensure that the public interest is served.

### Farm Numbers and Sizes

Declining farm numbers and increasing farm sizes are commonly cited indicators of the structural change in the farm sector. <sup>2/</sup> These indicators merely reflect the myriad forces causing structural change. They have some limited value, but more important are the changing of farm sizes and an understanding of the forces behind it.

A new official definition of a farm was instituted in 1979 by the U.S. Department of Agriculture (USDA). That definition recognizes inflation and other changes that have occurred in farming. The new definition requires a place to have \$1,000 minimum sales of farm products to be counted as a farm. The previous definition, used since 1959, required only \$50 in farm product sales on places of 10 acres or larger or \$250 on smaller places. The new 1978 definition would disqualify about 302,000 places--those with sales of less than \$1,000. Farm numbers under the new and old definitions are shown below:

	<u>1976</u>	<u>1977</u>	<u>1978</u>	<u>1979</u>
		<u>1,000 farms</u>		
Old definition	2,738	2,706	2,672	NA
New definition	<u>2,454</u>	<u>2,409</u>	<u>2,370</u>	<u>2,330</u>
Difference	284	297	302	NA
NA = not available				

Farm numbers continued downward from the 1935 peak of 6.8 million under both definitions. Average farm sizes increased correspondingly, measured by both sales and acres. Using the old definition of a farm for consistency, average sales per farm increased from \$9,715 in 1960, to \$19,861 in 1970, and to \$41,558 in 1978. Meanwhile, acres per farm rose from an average of 278 in 1960 to 401 in 1978, a 44-percent increase.

<sup>2/</sup> Benchmark data on farm numbers and sizes come primarily from the quinquennial Census of Agriculture. The next census is being taken in 1979, with the data being available for analysis in late 1980. In addition, estimates of farm numbers are made as of January 1 of each year by the U.S. Department of Agriculture to bridge the gap between censuses.

Information on farms grouped by product sales value is provided by the Census of Agriculture. The sales classes are:

Under		\$ 2,500
\$ 2,500	to	\$ 4,999
\$ 5,000	to	\$ 9,999
\$ 10,000	to	\$19,999
\$ 20,000	to	\$39,999
\$ 40,000	to	\$99,999
\$100,000	and over	

The decline in farm numbers over the past several decades largely reflects the phaseout of smaller farms. The number of farms in the larger size classes has increased.

Agriculture censuses prior to 1974 revealed that farms with at least \$20,000 in sales were increasing, while smaller farms were decreasing. Beginning with the 1974 census, the dividing point shifted to the sales classes of \$40,000 or more. It is impossible to precisely determine the size below which farms are declining in number because of the wide range of the \$40,000 to \$99,999 sales class. Nevertheless, if this sales class is viewed as an indication of adequacy for survival, some useful insight may be gained by examining the characteristics of such farms. Using the census sales classes to do this requires the study of averages of all farms in the \$40,000 to \$99,999 sales class. These statistical profiles are obtained by averaging many dissimilar farms over a wide range of sales, and meaningful comparisons are thus limited. A farm adequate for economic viability will vary greatly by farm type (commodity produced), geographic region, managerial and business acumen of the operator, family composition, tenure arrangement, and other factors. Even so, the profiles do provide useful information. They indicate that, on the average, farms and farmers in this sales class have the following characteristics:

- . Assets valued at nearly \$500,000;
- . more than 80 percent equity in these assets;
- . average 760 acres; and
- . net cash farm income of about \$18,500, nonfarm earnings of \$6,000, and unrealized appreciation in asset value of \$34,600.

Thus, even for farms in this minimum adequate sale class, increased asset value is the major source of increased wealth.



Here is a statistical profile of farms with \$40,000 to \$99,999 in gross sales:

<u>Characteristics (1977)</u>	<u>Amount</u>
Proportion of all farms (percent)	13
Proportion of total farm sales (percent)	26
Acres* (number)	760
Income:	
Sales of farm products	\$77,100
Expenses	<u>58,600</u>
Net cash income	\$18,500
Earnings from nonfarm sources	<u>6,000</u>
Total income	\$24,500
Capital gains on farm real estate (unrealized)	34,600
Assets:	
Land	\$340,000
Other	<u>121,900</u>
Total	\$461,900
Equity	\$373,000
Percentage equity	81

\* 1974 Census of Agriculture

The trend in farms growing in size and shrinking in number has paralleled an increasing concentration in assets and sales of farm products. Fewer farms account for the bulk of farm sales and the land in farms (table 1). This concentration

Table 1--Farms accounting for specified proportions of sales and land in farms

Item	Number of farms accounting for--			
	50 percent	75 percent	90 percent	
				<u>Thousands</u>
Sales:				
1964	205	675	1,280	
1974	125	475	825	
Land in farms:				
1964	125	525	1,400	
1974	97	395	970	

Source: (31).

reflects growth and consolidation of firms within the farming sector, rather than the entry of large outside firms.

The concentration of land in farms is not necessarily synonymous with concentration of landownership. Today, many farming operations are combinations of rented units or of owned and rented units. It is not uncommon in the Midwest, for example, to find farmland owned by retired farmers and widows and heirs of farmers, but consolidated through rental into larger farming operations. As table 1 indicates, 125,000 farms in 1974 accounted for one-half of all farm sales that had required 205,000 farms a decade before. Today, there are probably fewer than 100,000 such farms. Relative to some other sectors of the economy, this may not appear to be a high degree of concentration. It does reflect a reality far different from the common perception of an agriculture with most of the production coming from many moderate-size units.

Furthermore, these estimates encompass all farm production; they mask even higher degrees of concentration in the production of some commodities, such as eggs, certain fruits, vegetables, and tree nuts (table 2). Cotton production is also concentrated. Production of the major grains, oilseeds, and livestock tends to be less concentrated, although increasingly so.

Variations in concentration stem from many factors, including size of the market, size of firm needed for efficient operation, technology and cultural practices which affect the size of operation that can be farmed by one person or one family, and the differential influences of tax, credit, and commodity policies and programs.

Technological change remains important in increasing farm sizes and concentrating production. For example, the recent introduction of the large four-wheel-drive tractor disturbed the long-standing mix of farm sizes and numbers in several major regions by greatly increasing the acreage one person could efficiently farm. Once purchased, the tractor becomes a fixed cost to be spread over as many acres as

Table 2--Farms accounting for specified proportions of selected livestock inventories and commodity production, 1974

Item	Number of farms accounting for--		
	50 percent	75 percent	90 percent
	<u>Thousands</u>		
Livestock:			
Beef cows	135	325	560
Dairy cows	57	115	175
Sows farrowed	35	95	150
Commodity:			
Corn for grain	95	235	395
Cotton	6	19	35
Soybeans	75	178	300
Table eggs	1	4	8
Tobacco	20	50	90
Wheat	55	135	245

Source: (31).

possible. Another example is the breeding of tomato plants to obtain simultaneous ripening of the tomatoes. This increases the feasibility of mechanical harvesting and, in turn, the attraction of controlling enough acreage by one firm or person to fully utilize the capacity of the expensive mechanical harvester.

The capital investments associated with modern farming operations are substantial and growing. Farmers working with assets valued at considerably more than \$1 million are common. Land still contributes a high proportion of total asset value, although modern technology is increasingly expensive. Individual strategies influence the capital requirements for individual farms, so these asset values are not necessarily synonymous with capital requirements for individuals entering or staying in farming. They clearly indicate, however, the high level of management skill necessary for a successful modern farming operation.

### Operator Entry and Exit

Farm numbers and sizes adjust as individuals choose to enter or leave farming and as existing operators focus decisions on changes in size. These decisions are importantly related to the aging of existing operators. Historically, most people have begun farming before their 35th birthday, expanded the size of their operations over time, and then after age 55 begun to decrease the size, or at least stopped growth. They quit farming at some later point either through retirement or death.

The average age of farm operators steadily increased from 48.7 years in 1945 to 51.7 years in 1974. (The shift in the age distribution of farm operators for selected censuses is shown in fig. 1.) The change was significant for this three-decade period, since many people spend over 50 years in the same occupation and the turnover rate is slow. The age distribution shifts because fewer young persons enter farming than older operators leave. Also, many of the older operators continue to farm past the usual retirement age, so they are not being replaced by a younger generation.

Age cohorts (people with common birthdays) can be traced through successive agricultural censuses to determine net changes in the number in each age cohort by size of farm. Historically, the number of operators in each age cohort group increases as that particular group grows older, peaks at age 50, and then declines until all operators leave farming presumably by age 75.

Only slightly more than half of the older persons leaving farming between 1964 and 1974 were replaced by young farmers. A net of 930,000 (72 percent) of the operators who were 55 years of age or older in 1964 had left farming by the time the 1974 Census of Agriculture was taken, while only 475,000 persons under 35 had begun farming.

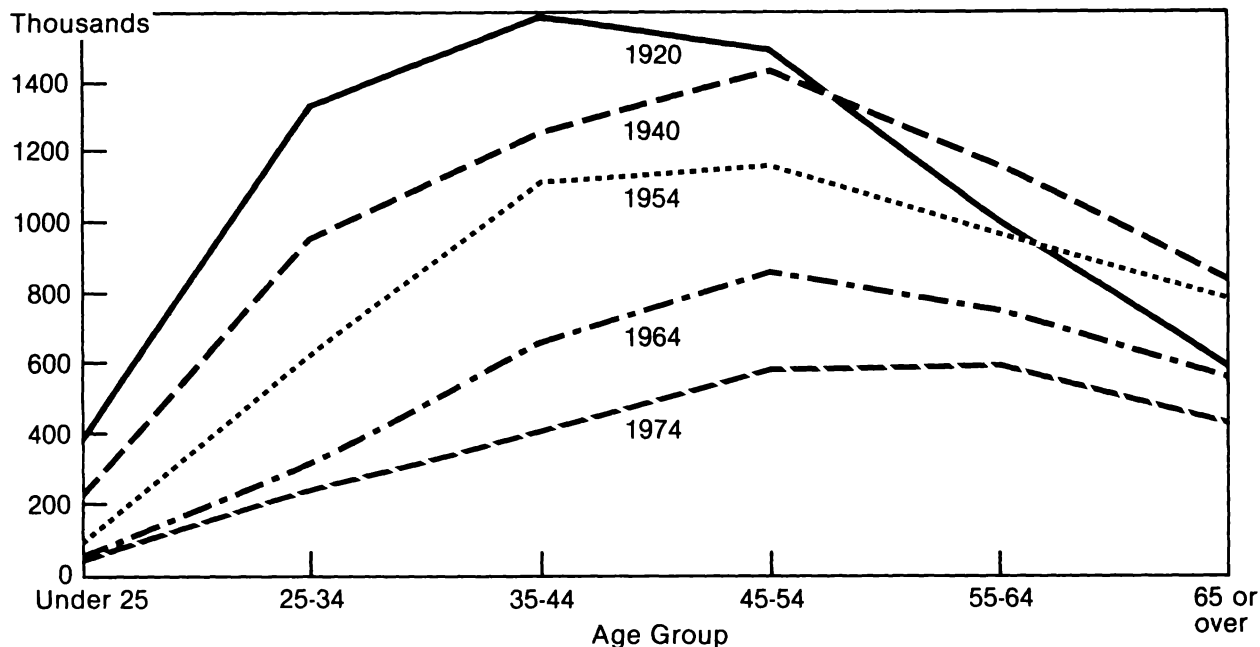
Only one small-farm operator with sales of less than \$40,000 was replaced for every three who left. Still, 80 percent of the young people who entered farming during 1964-74 started on farms with sales of less than \$40,000. Many of those were part-time farmers with their primary income from nonfarm sources. Beginning farmers in the previous decade on small farms expanded to more than \$40,000 in sales.

The replacement rate on farms with sales of \$40,000 or more was higher. Entry rates of young people exceeded exit rates of older operators. This happened because some entrants combined two or more small farms and entered in the larger size classes. Also, some of the smaller farms of entrants in the previous decade were enlarged and moved into these classes.

Some older operators on smaller farms progress towards retirement in a series of steps--by renting out some land, or selling owned land, or relinquishing land they

Figure 1

## Farm Operator Age Distribution, 1920-74.



Source: (31).

rent. This is frequently accompanied by conversion to less labor intensive enterprises, such as changing from dairy to beef cows.

The number of farms is expected to continue to decline, primarily from nonreplacement of exiting older operators by younger operators. Fewer total entrants are expected in the next decade, and a higher percentage of entrants will be on large farms.

The trend of fewer and larger farms means fewer replacements will be needed for operators on viable fulltime farms. Many of the smaller farms of retiring operators will be combined with existing farms to form larger units. Their formation will require high levels of equity or risk capital. Young people hoping to enter farming are typically short on capital. Therefore, farming opportunities will be limited to a few entries on larger farms, with young people more often beginning on established farms as partners or shareholders with other family members in partnership and corporate operations.

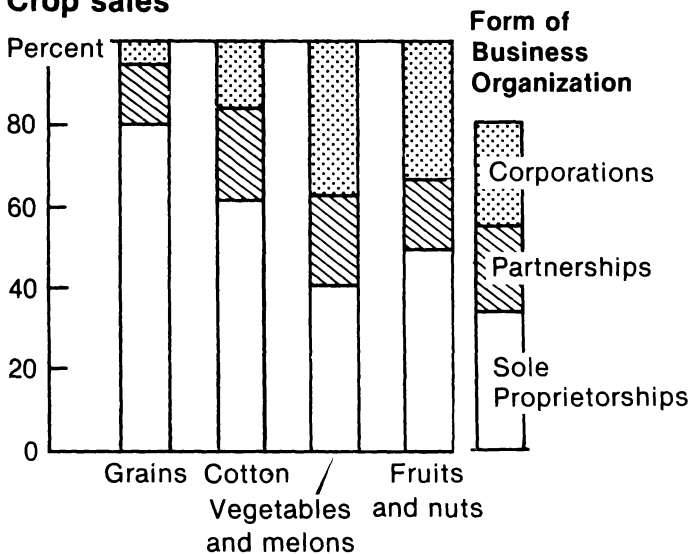
### Form of Organization

Multiownership farms (partnerships and corporations) accounted for only 10 percent of farms in 1974, but being larger they sold nearly a third of all farm products and farmed one-fourth of the land. Corporations comprised a very small number of farms, but they accounted for 18 percent of the farm products sold, an expansion from their 14-percent share in 1969. Farms organized as corporations tend to specialize in land and capital intensive production, while the sole proprietorship farms typically produce grains, tobacco, beef cattle, hogs, and dairy cattle (fig. 2).

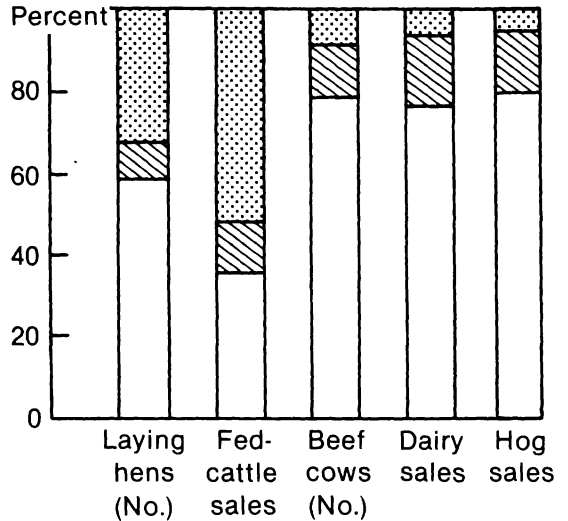
Figure 2

## Crop Sales and Livestock Numbers and Sales of Farms with Sales of \$2,500 or More

### Crop sales\*



### Livestock numbers and sales\*



\*May not add to 100 percent because smaller farms are excluded.

Source: (32).

### Partnerships

Most multiownership farms are multifamily operations. The 81,738 farm partnerships enumerated in a 1976 survey were largely composed of a few related partners per farm. Ninety-two percent of all partnerships had three or fewer partners, the partnerships often were two generations of the same family, and 70 percent operated with oral agreements. Forty-two percent of all partnerships had at least one older family member and one or two partners of a younger generation, indicating a frequent use of the partnership form of organization to bring a younger person into the farm business.

### Corporations

Farming corporations, like partnerships, tend to be closely held by a few family shareholders. Eighty percent of privately held farming corporations had five or fewer shareholders, and 79 percent were family owned, with family members directly involved in daily operations. Ninety percent of the closely held corporations had most of their management provided by shareholders. Farming is the primary, and often the only, business for these corporations. Corporations are frequently operated similar to partnerships and often formed to preserve the family farming operation by facilitating the transfer of assets between generations.

Most of the farm corporations in 1974 with 10 or more shareholders, including those whose shares were publicly traded, were in California, Florida, Texas, Hawaii, and Louisiana. Those States had two-fifths of the farms operated by publicly owned corporations and one-third of the farms operated by corporations with 11 or more

shareholders. The 1974 census counted 358 publicly traded corporations operating 947 farms.

Publicly held corporations sold only 3 percent of the total farm production in 1974; the primary business receipts in 82 percent of the corporations were from nonfarm sources. Their major commodities were fed cattle, poultry, sugarcane, potatoes, fruits, vegetables, and nursery products which accounted for nearly 90 percent of their 1974 farm sales. Only 6 percent of their sales were from grain and cotton.

The characteristics of markets, the size of operations needed to exploit production and market economies, and the opportunities to exploit linkages with subsequent stages of the marketing system are factors influencing the commodities produced by the diversely owned corporations. These corporations do not produce land-extensive commodities (such as grains, cotton, and beef cows) to any great degree. Generally, they find no particular advantage in producing the undifferentiated, widely produced commodities. They have very few incentives for vertical integration in land-extensive commodities, since most processors can purchase by standard grade the quantities they need more cheaply than they produce it, given their costs and alternative uses for capital.

The trends point toward more corporations in farming and a continual decline in partnerships. Overall, the output of multiownership farms could account for about half of farm sales before the end of the century. Most of these multiownership farms will likely continue to be multifamily farms. Two decades will probably not bring much dispersion of ownership of present farming corporations. Addition of new corporations will likely result from incorporation of existing farms rather than entry of corporations not now farming. Few nonfarm corporations are likely to be attracted into farming, barring a significant rise in the profitability of farming. The rate of incorporation of existing farms could well exceed the present trend because of changes in income tax laws, more rapid rise in asset values, and new technology encouraging larger farms.

#### ALTERNATIVE MARKETING APPROACHES FOR FARMERS

Markets for farm commodities were formerly organized to serve the needs of small, independent farmers who produced the bulk of the agricultural output. Two important functions of these markets were to serve as assembly points and price discovery points for farm commodities. The marketing sector then served as a vehicle to move farm output to the final consumer. Farm markets were generally accessible to all farmers, and farm market coordination was accomplished through open market transactions in which the pricing mechanism was the primary coordinating device.

Changes in the structure and organization of both the farm and the marketing sectors over the past 20 to 25 years have altered relationships between them. Farms have become larger, fewer, and more specialized, largely as a result of technological innovations introduced over the last three decades, although other factors also contributed. Marketing firms have also become larger and fewer in number during this period. The most significant structural change in the marketing sector, however, has been the growth of large regional and national food-marketing organizations and the decline of smaller firms serving localized markets.

Structural changes in these two sectors have been associated with the growth of direct linkages between farmers and the processors and marketers of farm-produced commodities. Country buying stations and assembly point markets have dwindled as both

large farmers and buyers have chosen to bypass these traditional farm markets in favor of more direct-marketing methods, including the use of production and marketing contracts. Significant amounts of some commodities are produced by firms with off-farm businesses that have integrated farm production with nonfarm stages of the food system.

There are advantages both to farmers and to marketing firms from the use of contracting and other direct farmer-market links, but many contend that these marketing techniques favor the larger producers. Some minimum volume of product is needed to encourage a marketing firm to enter into a contract with a farmer or to attract buyers to the farm. Small farmers apparently do not produce those minimum volumes of most commodities. As a result, they may have serious problems finding market outlets if traditional markets decline in favor of contractual arrangements. This reduced market access has been cited by some as a major factor in the decline in the number of small farms.

The decline of traditional farm markets and their replacement by marketing methods more suitable to large farms has generated interest in developing alternative market outlets that will serve the needs of small farmers. Several approaches have been proposed to accomplish this end. Two of these are forward contracting and farmer-to-consumer direct marketing.

#### Forward Contracting

Agricultural production under some form of contractual arrangement has been gradually increasing since 1960, the first year the Bureau of the Census attempted to gather data on the use of contracts in agriculture. About 4.5 percent (147,000) of all farm operators reported having contracts relating to the production or marketing of farm commodities in that year. The 1969 Census of Agriculture reported 156,000 contracts by farms with sales of \$2,500 and over. Some farmers had multiple contracts, so the contracts outnumbered farms reporting contracts. However, the number of farms with contracts was not tabulated. The 1974 census counted about 156,000 farms with sales of \$2,500 or more having nearly 190,000 production or marketing contracts. That was over 9 percent of farms with sales of \$2,500 or more in 1974.

#### Extent of Contracting

Mighell and Hoofnagle estimated that about 17 percent of total farm output was produced or marketed under some form of contractual arrangement in 1970 (16). Less than 10 percent of all crops and nearly a third of livestock and poultry products were under contract. Contracts were widely used in the production and marketing of fruits, vegetables, sugar crops, seed crops, dairy products, and poultry products. There was very limited use of contracts for most other commodities.

The major change in contract farming since 1970 has been a sharp increase in the use of forward sales contracts in marketing cash grains, oilseeds, and cotton. Census of Agriculture data indicate that farmers marketed about 7 percent of corn production, 8 percent of wheat, 11 percent of soybeans, and 20 percent of cotton under contractual arrangements in 1974 (table 3). Other significant changes were a growth in feeder-pig contracting and a decline in fed-cattle contracting due to a temporary decrease in custom feeding of cattle. Contracts were used in producing or marketing an estimated 21 percent of all agricultural commodities in 1974.

Table 3--Production or marketing under contractual arrangement, 1974

Item	: Amount under contract	::	Item	: Amount under contract
	: <u>Percent</u>	::		: <u>Percent</u>
All cash grains	: 9	::	Poultry and	:
Corn	: 7	::	poultry products:	38
Cotton	: 20	::	Soybeans	: 11
Dairy products	: <u>1/</u> 82	::	Sugar beets	: <u>1/</u> 98
Fed cattle	: 5	::	Vegetables	: 48
Feeder pigs	: 3	::	Wheat	: 8
Fruit	: 32	::		:
Hogs	: 1	::	All commodities	: 21
	:	::		:

1/ Estimates from (16). Weighted average of fluid-grade and manufacturing-grade milk used to calculate percentage of dairy products under contract.

Source: (31).

#### Contracting and Farm Sales Class

The average farm using contracts in the production or marketing of its output had product sales of nearly \$123,000 in 1974. This greatly surpassed the \$48,000 volume of the typical commercial farm. Farms with sales of \$100,000 or more, while only about 9 percent of the farms with sales of \$2,500 or more, accounted for nearly a third of the reported contracts (table 4). At the other end of the scale, farms with sales between \$2,500 and \$19,999 accounted for 53 percent of the farms but only 17 percent of reported contracts. This disparity between small and large farms in the use of contracting, however, may be accentuated by the use of multiple contracts by large farms.

Another indication of the concentration of contracting in the larger farms can be obtained by examining the proportion of farms in each sales class using contracts (table 4). Less than 4 percent of farms with total sales under \$20,000 reported using contracts in 1974, while about 30 percent of farms with sales of \$100,000 and over reported using contracts.

A final comparison is provided in table 5 which indicates that about a fourth of the farms reporting the amount received from the contractor for commodities under contract in 1974 had contract receipts of \$30,000 or more. These farms, though, had over four-fifths of total reported contract receipts. Twenty-eight percent of the farms reporting contract receipts received under \$5,000 and accounted for less than 2 percent of the total reported contract receipts.

#### Contract Terms

Contract farming has often been criticized on the grounds that it is a device used by large food-processing and marketing firms to gain control over the farmer and in effect make him an employee of the processing or marketing firm. Contracting in the traditional belief and value system that surrounds much of U.S. agriculture is seen as an incursion on the farmer's freedom and independence, imposing external obligations, and limiting the choice of management decisions. The degree to which a



Table 4--Distribution of farms and contracts and farms reporting contracts,  
by sales class, 1974

Sales class	Distribution by sales class		Farms in sales classes reporting contracts
	Farms	Contracts	
		<u>Percent</u>	
\$2,500-\$4,999	17	2	1.6
\$5,000-\$9,999	18	5	3.0
\$10,000-\$19,999	18	10	5.9
\$20,000-\$39,999	19	18	8.5
\$40,000-\$99,999	19	35	16.1
\$100,000-\$199,999	6	18	26.5
\$200,000-\$499,999	2	9	34.5
\$500,000 and over	1	3	39.2
All sales classes	100	100	9.4

Source: (31).

Table 5--Distribution of farms with contracts, by amount received from contractor

Amount received from contractor	Farms reporting	Contract receipts reported
	<u>Percent</u>	
Under \$5,000	27.6	1.8
\$5,000-\$14,999	31.3	7.7
\$15,000-\$29,999	16.6	9.3
\$30,000 and over	24.5	81.2

Source: (31).

farmer's management decisions are limited varies greatly and depends on the terms of the contract. Contracts between farmers and marketing firms fall into two basic categories: production and marketing contracts.

Production contracts are generally made before production begins. They contain provisions regulating, specifying, or controlling the cultural or husbandry practices employed in producing the commodity. By their nature, production contracts entail some degree of contractor involvement in the farming operation. Such involvement ranges from simple contract requirements with only periodic contractor monitoring to detailed cultural specifications with strict supervision by the contractor. Contract terms often obligate the contractor to provide production inputs and commonly give ownership of commodities under contract to the contractor during the production period. Production contracts also contain marketing provisions relating to pricing and payment procedures and product delivery.

Marketing contracts, in contrast, may be entered into at any time during the production or marketing period. They do not involve the contractor in the production

process. <sup>3/</sup> A marketing contract in its simplest form is an agreement, written or oral, for future delivery of a commodity. The terms normally specify the quantity, type, variety, and grade or quality of the commodity, as well as price and delivery provisions.

### Price Terms

Terms relating to product price and the bases for price determination are among the most important provisions of agricultural production and marketing contracts; these provisions are where contractors exercise the most control. Accordingly, negotiation of price terms is the most prominent form of involvement by producer bargaining organizations in contract development.

In the 1977 joint Census-USDA survey of contract production, price terms were under the exclusive control of the contractor more than any other type of contract provisions. Two-thirds of the respondents indicated that the contractor alone set the price terms. Nine percent of those responding said price terms were set by the producer, 19 percent said price terms were arrived at jointly by the producer and contractor, and 6 percent indicated that price terms were set by a producer organization.

### Nonprice Terms

The nonprice terms of agricultural contracts are concerned primarily with product specification, cultural or husbandry practices, delivery of the product to the contractor, and specification of which party provides certain production inputs. In particular, nonprice terms relating to cultural or husbandry practices and provision of inputs are what distinguish production contracts from marketing contracts. They are also the means by which the processing and marketing sectors are able to attain direct management control over farming operations without acquiring ownership of agricultural resources. Consequently, nonprice contract terms can play a major role in shifting control over the Nation's agricultural output from the farm sector to the nonfarm sectors. The 1977 Census-USDA survey of contract production collected extensive data on nonprice contract terms. This information was obtained from contract producers to measure the extent to which contractors controlled the actual production process in the commodities included in the survey.

Contractor control was most pervasive in broiler and egg contracts and control over production extended well into the day-to-day husbandry practices. In nearly all instances, the contractor provided the production and marketing inputs other than labor, housing, and equipment. Broiler and egg contracts basically are devices used by the contractor to lease production facilities and hire labor owned by the contract producer's labor force. Contractor control over the production process and ownership of other production inputs is so complete as to make the contractor rather than the farmer the real producer.

At the opposite extreme, contractors for feeder cattle and feeder pigs exert little or no control over the production process with nearly all contracts being nothing more than contracts for future delivery. The contractor's major interests are to specify quantity, breed, and ending weights, but even in these areas, the producers specify the terms in most contracts.

Slaughter-hog contracts are about equally divided between production contracts similar to those for broilers and eggs and forward delivery marketing contracts.

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<sup>3/</sup> To be considered a contract, an agreement or obligation to sell must be entered into 30 days or more prior to the actual delivery of the commodity.

Contract hog production is a fairly recent development, accounting for only about 1 percent of all output. Although contracting for hogs is expected to increase, it is not clear which type of contract--production or marketing--will be prevalent.

Production contracts are generally entered into for processing tomatoes and potatoes. However, they differ markedly from broiler and egg contracts in that the contractors exert little influence over cultural practices. Contractor involvement in the tomato and potato production processes is largely restricted to commodity specification, quantity of production, and product delivery. Contract terms relating to these areas are frequently determined jointly by the contractor and producer. Cultural practices are generally left up to the producer, and input items provided by the contractor are limited to plants, seeds, technical assistance, and marketing services.

### Reasons for Contracting

The criticism that contract farming makes the farmer a mere employee of the processing or marketing firm fails to consider the interdependence between the farm and nonfarm parts of the food and fiber system. Farming is only one stage in bringing food and fiber products to the consumer. The orderly functioning of the system requires that the activities of each stage be coordinated with the other stages. Contract farming is one of several institutional arrangements to achieve this coordination. It provides both the farmer and the marketing firms a means of dealing with the many risks inherent in producing and marketing agricultural commodities.

### Contracting from the Buyer Standpoint

The processor or marketer of perishable agricultural commodities faces a number of risks with respect to raw product supplies. These include raw product availability, price, and quality. Contracting for farm production provides the processing-marketing sector with a means of managing these risks.

There are two important aspects of raw product availability to the buyer of farm commodities. One is the total volume of farm output of a commodity. The other is the rate at which the commodity is delivered to the buyer. Contracting with farmers for future delivery enables marketing firms to rationalize production with expected market demand. This allows the marketing sector to develop longer range marketing programs, and consequently serves as an aid to orderly marketing. Processors and marketers must schedule their labor, transportation, and other inputs in advance to ensure an efficient operation. Contracts allow marketing firms to schedule their receipts of raw commodities more precisely than would be possible if they relied on open-market purchases of farm commodities.

Modern mass marketing techniques require a uniform product, which in turn requires that farm commodities be standardized with respect to variety, grade, size, and other characteristics. Contract specification of these characteristics and contractor specification and supervision of production practices in some commodities are means of achieving this standardization. The need for raw product uniformity is the major reason many contracts specify that the buyer provide such inputs as plants, seed, chicks, and feed. It would be difficult and costly for the processing-marketing sector to attain the product quality and uniformity needed to sustain its marketing programs without the use of contracts.

### Contracting from the Producer Standpoint

Producers, like buyers, enter into contractual agreements primarily as a means of risk management. Producer risks related to market access, price, and access to capital are major types conducive to contracting.

Market access, especially for highly perishable commodities and commodities that have limited market outlets, is a major concern of producers. Simply producing such commodities with the hope of finding a market at the end of the production period is highly speculative. Farmers with such commodities to sell are vulnerable with respect to obtaining a reasonable price, if they can find a buyer at all. They are in a much stronger position to deal with prospective buyers prior to making production commitments. Consequently, producers of perishable and specialty commodities have a strong incentive to sell prior to committing resources to production, and so a high proportion of such commodities are produced under contract.

By the same token, traditional lending agencies hesitate to finance open production of high-risk commodities, but readily advance production capital when they are produced under contract. Contractors themselves provide significant financing of these commodities, usually by advancing key production inputs.

Price variability for storable, nonperishable commodities is the major factor leading producers into contractual arrangements. Most contracts for commodities of this type are agreements to deliver a fixed volume sometime in the future at a set contract price. These contracts are initiated by the producer as a means of pricing his production at a known acceptable level, thereby reducing exposure to price risk.

#### Collective Action by Farmers to Improve Market Power

Farmers have effectively used group action to improve their market power relative to contract buyers. Farmers, through processing-marketing cooperatives, may compete with entrepreneurial marketing firms. Alternatively, farmers may use bargaining associations to negotiate contract terms with marketing firms.

Cooperatives, in effect, are joint arrangements established by groups of farmers to process and/or market their production. Cooperatives compete with other processing-marketing firms for final product markets. They are generally smaller than noncooperative firms, but a few have achieved a size sufficient to be counted among the largest firms in the Nation. Thus, cooperatives provide farmers with a means of sharing in the returns from processing and marketing their commodities.

Cooperatives were listed as the contractor in over a third of all contracts reported in the 1974 Census of Agriculture (table 6). The percentage of commodity contracts in which the contractor was a cooperative ranged from three-fourths for milk to 5 percent or less for fed, feeder, and breeding cattle.

Producer bargaining associations are groups of farmers organized to negotiate contract terms for their members. Unlike cooperatives, they do not handle, process, or market their members' produce. The 1977 survey of contract production found that, of the seven commodities covered in the survey, bargaining associations were most active in processing tomatoes and potatoes, where they represented 40 and 60 percent of the contracts, and least active in broiler and egg contracts (table 6).

#### Federal Policies and Contract Farming

Federal policies and programs influence contract farming mainly through their impacts on risk, both as it affects the producer and the buyer. Policies or programs that are risk reducing discourage contracting, while policies that increase risk encourage contracting. Influencing the level of contracting are commodity stabilization programs, farm credit policies, and food quality and safety policies.

The relatively recent changes in the economic environment for agriculture and provisions of the commodity programs have been factors partly responsible for the increase in contract selling of grains and cotton between 1970 and 1974. Earlier

Table 6--Contracts involving cooperatives and bargaining associations

Commodity	: Percentage of : contracts with : cooperatives	::	Commodity	: Percentage of : contracts with : cooperatives
	<u>Percent</u>	::		<u>Percent</u>
Livestock and poultry:		::	Crops:--continued	
Breeding cattle	5.1	::	Soybeans	40.9
Breeding hogs	6.1	::	Sugar beets	16.0
Broilers	10.1	::	Wheat	44.3
Chicken eggs	11.5	::	Other	20.3
Fattened cattle	4.8	::		
Feeder cattle	4.0	::	All commodities	35.9
Feeder pigs	52.5	::		
Slaughter hogs	18.5	::		Percentage of
Started pullets	8.0	::		contracts with
Turkeys	8.0	::		bargaining
Other	18.3	::		associations
		::		
Milk	77.4	::		<u>Percent</u>
		::		
Crops:		::	Broilers	2.9
Cotton	22.8	::	Eggs	2.3
Field corn	40.5	::	Feeder cattle	10.0
Fresh fruit	61.5	::	Feeder pigs	7.6
Fresh vegetables	15.5	::	Potatoes	59.1
Processing fruit	50.2	::	Processing tomatoes	40.4
Processing vegetables	5.5	::	Slaughter hogs	16.1
		::		

Sources: (31, 33).

programs relied on high support prices, which in effect became the market prices at which the commodities were traded. Large commodity stocks, built up in the operation of the programs, prevented prices from rising above the support levels, while the support prices set a floor below which market prices could not fall. Thus, prices were very stable and were known in advance with a high degree of accuracy by both farmers and buyers. Facing very little price or supply risk, they had no incentive to enter into contractual arrangements.

The decade of the seventies brought a significant increase in the importance of foreign markets to domestic agriculture. Accompanying the expansion in foreign markets was an increase in potential economic instability, arising from world weather, political, and economic conditions. This new economic environment for agriculture also implies a changed role for the commodity programs. Government price supports no longer determine market prices to the extent they formerly did. Income support is now provided as direct payments through the target price program, rather than through price supports. The result is that commodity prices are now able to fluctuate in response to market conditions. This adds some degree of price risk, providing farmers with an incentive to initiate forward delivery contracts as a means of fixing a price for their production. This type of contracting has emerged as a part of the marketing strategy of grain and cotton producers.

Federal credit programs probably limit contracting, as they serve to shift financial risks from farmers to the taxpayers. A large portion of the credit granted under these programs is to borrowers and projects that have a risk level unacceptable to commercial lenders. In the absence of such programs, farmers unable to obtain credit from traditional sources would have an incentive to turn to the marketing sector for production capital (mainly in the form of physical inputs) through production contracts. A large part of the financial risks would be absorbed by the contractors.

Food safety and quality programs may serve as an inducement to contracting by increasing the raw product quality risks of processors. Restrictions on contaminants and adulterants in consumer food products provide processors with a motive to control the application of pesticides and other agricultural chemicals to ensure that any residues on raw commodities will not contaminate the end product. One means of achieving this control is through production contracts.

### Structural Implications of Contract Farming

The obvious structural impacts of contract farming relate to the relationships between the farm and nonfarm parts of the food and fiber system. There are in addition, however, impacts on the structure of the farm sector. These concern both the number and size structure of the farm sector and the manner in which the output of individual farms is coordinated. This is referred to as horizontal coordination.

### Horizontal Coordination Among Farm Firms

Plant or firm size in the agricultural processing and marketing sectors is very large relative to firm size in the farm sector, and the output of many farms is required to supply the raw product input for a single processing plant. If this processing plant were to enter into individual contracts for the output of each of these farms, the immediate effect would be to link each farm individually to the processor. Through the terms of the individual contracts, however, the processor will have effectively coordinated the production of many farms in a horizontal sense. Individual farms will be functioning as a single firm under the direction of the contractor.

Farmers as well as marketing firms may be the instigators of horizontal coordination in contractual relationships. Farmer bargaining associations are groups of farmers who have integrated horizontally for the purpose of negotiating contract terms with marketing firms. Farmers coordinate their production and marketing functions in a horizontal sense through their processing and marketing cooperatives.

One effect of contracting on the horizontal structure of the farm sector is to transform the sector into a number of horizontally coordinated market blocks. For those commodities in which contracting is the prevalent market arrangement (including dairy products, broilers, and a number of fruits and vegetables), both farmers and marketing firms who do not have contracts may be effectively locked out. Noncontracting producers may have difficulty finding a market or receiving reasonable prices, and noncontracting buyers may have difficulty finding noncommitted supplies to buy (17).

### Impacts of Contracting on Farm Size

As noted earlier, farms using contracts have much larger sales volumes than others. This indicates a correlation between farm size and the incidence of contracting. Both census data on the size distribution of farms with contracts and other studies support this statement (18). The cause and effect relationships between farm size and contracting, however, have not been adequately addressed. Consequently,

it is not clear whether contracting is a result of large farms or large farms are a result of contracting. It is probable that the relationship goes both ways.

Large specialized farms generally are more susceptible to risk, uncertainty, and instability than are their smaller, less specialized counterparts. Consequently, they have a greater incentive to seek ways to reduce or transfer risk, such as through the use of contracts. In this respect, the growth in contract farming is an inevitable result of size-increasing technological innovations and increased specialization in farming.

On the other hand, contract buyers prefer to deal with larger producers. This preference is cost related. Both administrative and assembly costs per unit purchased are lower when large lots are involved. In addition, small producers often have difficulty meeting the quality specifications of contract buyers. In their analysis of feeder-cattle contracts in the Texas Rolling Plains, Moore and Martin (18) concluded that:

There are several reasons why one would expect the use of beef cattle contracts to be associated only with the larger beef cattle producers. Contractors prefer to deal with large producers that can sell truck-load lots because it is costly to visit small producers, who may be scattered over a wide area, to inspect cattle and collect them when ready for market. Also, buyers who are willing to contract their purchases in advance of their needs are usually looking for certain grades, weights, and types of cattle for delivery at a specified date. Small beef cattle producers with limited quantities and types of cattle usually cannot fulfill these specific requirements.

#### Implications and Conclusions about Contracting

The institution of contracting itself may not be the primary factor causing increased farm size, and in fact may be a result of increased farm size, but it nevertheless plays a significant role in the changing structure of agriculture. Risk and uncertainty have been cited by some researchers as factors limiting the size of farms. To the extent that contracting is an effective means of reducing some of the risks inherent in farming, it increases the comparative advantages of large farms relative to smaller farms. Also, the economics of contracting favor large farms. Consequently, a situation develops in which the growth of large farms leads to contract production, which encourages the further growth of large farms.

Contracting, however, cannot be viewed as a panacea for risk that affects the individual farmer. Price and market access risks are often reduced by means of contracting, but output and default risks remain real problems for the farmer who enters into a contractual arrangement (22).

Traditional open markets for a commodity may die out when contracting becomes the prevalent market arrangement for that commodity. The result is that producers without contracts find themselves with no outlets for their production. Large producers are more readily able to obtain contracts than are small ones, so the brunt of the decline of traditional market outlets falls on small farmers. Consequently, the growth of contracting has major implications to the continued survival of small farms. In effect, small farms must grow to a size sufficient to attract contract buyers, develop alternative markets, band together with other small producers in cooperatives, or cease production of that commodity. Rhodes lists three possible alternatives for small farmers whose traditional markets are in a state of erosion (23): (1) attempt to preserve an open market system by active development of such market mechanisms, (2) build their own marketing agencies through cooperative action, and (3) drop production of the commodity, depend on other crops, and seek relief

through the political process via high price supports for the other crops. Rhodes fears that the third alternative may win out by default.

The use of contracts in the production and marketing of agricultural commodities is a permanent fixture of the structure of the farm sector, and is the prevalent arrangement for such commodities as milk, broilers, sugar beets, processing vegetables, and several fruit and nut crops. The major commodities that seem likely candidates for increased usage of contracts are hogs and crops produced under commodity programs, assuming the current type of programs remains in effect.

The growth of large-scale, specialized hog enterprises is the main factor that will lead to increased use of hog contracts. Only 1 percent of all hogs are currently marketed under contract, but a recent study estimated that about 15 percent of the hogs sold by producers selling 5,000 or more hogs per year were under contract in 1978 (24). Both the number of large hog operations and the proportion of hogs marketed by them have been increasing in recent years.

Increased use of contracts in crops covered by commodity programs depends on the types of programs in effect. If programs that allow for free play of market prices remain in effect, a growth in contract marketing of these commodities can be expected because farmers will increase their use of forward sales contracts as a means of dealing with price risks. A return to the previous high support price programs would result in a virtual cessation of contract sales for commodities affected.

#### Farmer-to-Consumer Direct Marketing

Farmer-to-consumer direct marketing has received considerable attention in the past few years as a possible method to serve the needs of small farmers. The Farmer-to-Consumer Direct Marketing Act, Public Law 94-463, was enacted in 1976 to promote direct-marketing activities that might lower prices to consumers, provide higher returns to farmers, and improve producer-consumer understanding. Under the provisions of this act, the Economics, Statistics, and Cooperatives Service (ESCS) initiated several research activities to determine the extent of direct marketing and its potential for enhancing the economic viability of small farmers.

Farmer-to-consumer direct marketing is a form of vertical integration in that both production and marketing functions are combined in the same firm. However, unlike the vertical integration characteristic of large-scale agricultural firms, it does not rely on the established distribution network to reach the consumer and does not require large-scale production units to support its marketing function.

#### Extent of Farmer-to-Consumer Direct Marketing

The most recent national survey for which data are available indicates there were about 13,000 direct marketing outlets operating in all 50 States in 1976 (1). The heaviest concentration was in the Northeast and Lake States. Roadside stands, pick-your-own-operations, and farmers' markets were the most common types. Others included trucks parked at shopping centers, door-to-door routes, small on-farm dairy outlets, cooperatives dealing directly with consumer groups, and informal arrangements between friends and neighbors (15).

There are no reliable estimates of the total value of products sold through farmer-to-consumer direct-marketing outlets. The American Vegetable Grower estimates that gross sales of roadside stands in 17 of the States which responded to its survey were about \$208.8 million in 1976 (table 7). This estimate does not include sales through farmers' markets, pick-your-own operations, and sales of roadside stands in 33



Table 7--Estimated gross sales of roadside stands, 17 states, 1976 1/

State	Gross sales	State	Gross sales
	<u>1,000 dollars</u>		<u>1,000 dollars</u>
New Jersey	50,000	Arizona	2,875
Pennsylvania	40,000	Tennessee	2,500
New York	35,000	Texas	2,500
Ohio	30,000	Georgia	750
Massachusetts	24,750	Rhode Island	750
Indiana	6,000	North Carolina	580
Maryland	5,000	South Dakota	375
Michigan	4,500	North Dakota	20
New Hampshire	3,230	Total	208,830

1/ Estimates not available for all States.

Source: (1).

States. The National Commission of Food Marketing estimated that in 1963 about 0.4 percent of all food sales nationwide were through direct-marketing outlets (19).

Fresh fruits and vegetables are the commodities most commonly sold through direct-marketing outlets. Other commodities include eggs, dairy products, tree nuts, honey, bedding plants, and shrubbery. Commodities that can be successfully marketed through direct-marketing outlets are generally limited to those not requiring processing beyond sorting and packing.

#### Structural Impacts of Farmer-to-Consumer Direct Marketing

The potential impacts of farmer-to-consumer direct marketing on the structure of agriculture are quite limited. Both the kinds of commodities suitable for this type of marketing and the locational requirements for successful direct marketing are factors limiting its potential for improving the economic position of small farmers and affecting the structure of agriculture and agricultural markets.

Commodities suitable for farmer-to-consumer transactions are those that can be consumed fresh or can readily be processed by household preservation methods, such as home canning and freezing. This requirement limits the potential for direct marketing to vegetables, fruits, eggs, and a few specialty commodities. Commodities falling into this category account for less than 10 percent of the value of agricultural products sold. Ninety percent or more of the products (in terms of value) sold by farmers, including grains, cotton, sugar crops, forage and hay, tobacco, oilseeds, and most livestock and poultry, cannot be marketed through direct farmer-to-consumer

outlets because of the extensive processing required to convert farm commodities into consumer food and fiber products. 4/

About 12 percent of the commodities suitable for direct-market sales are produced on farms with gross sales under \$40,000, the size classes that could benefit most from direct marketing (table 8). About three-fourths of these commodities are produced on farms grossing \$100,000 or more. Assuming that no shifts occur in the distribution of production among farm sales classes and that the total output of suitable commodities produced on smaller farms could be sold directly to consumers, the potential for farmer-to-consumer sales by smaller growers is just slightly over 1 percent of the total value of all farm sales.

The second major limitation of farmer-to-consumer direct marketing is location of production. Farmers and consumers must be accessible to each other for direct marketing to succeed. For producers, this means a location near a major population center. For consumers, it means sufficient nearby production of commodities suitable for direct purchase from farmers to attract their interest. As one observer noted, a direct-marketing outlet must have "enough goods to make the trip worthwhile for customers, enough customers to make the trip worthwhile for farmers (15)." The potential, then, for farmer-to-consumer direct marketing is greatest in areas that have both high population density and a reasonably high density of fruit or vegetable production. Fruits and vegetables account for about 75 percent of the value of commodities that can be marketed through direct market outlets. The Northeast comes closest to meeting these requirements (table 9). Not surprisingly, the Northeastern States also have the highest concentrations of direct marketing outlets.

Implications and Conclusions

The potential impact of policies to increase farmer-to-consumer direct marketing on the structure of the farm production and marketing sectors is very small overall, primarily because of limitations on the kinds of commodities that are suitable for direct sales and because of locational requirements. Farms that can benefit the most from direct marketing programs are those with gross sales under \$40,000. Although

Table 8--Percentage of value of output of commodities suitable for farmer-to-consumer direct marketing, by farm sales class, 1974

Commodity	Farm sales class				
	Under \$10,000	\$10,000-\$39,999	\$40,000-\$99,999	\$100,000 and over	
					Percent
Fruit	3.4	13.8	17.8	65.0	
Vegetables	1.8	7.0	9.2	82.0	
Other	2.0	7.8	12.0	78.2	
Total	2.5	10.0	13.5	74.0	

Source: (31).

4/ There is a very small market for farm slaughtered livestock and poultry that is met primarily by direct farmer-to-consumer sales. This is also true for some dairy products.

Table 9--Relationships among State population, fruit production, vegetable production, and direct marketing

Ranking	Population <u>1/</u>		Fruit	Vegetable	Direct- marketing outlets
	Per square	Total	production/ square mile	production/ square mile	
	mile		<u>2/</u>	<u>2/</u>	
	<u>States</u>				
1	N.J.	Calif.	Fla.	N.J.	N.Y.
2	R.I.	N.Y.	Calif.	Calif.	N.J.
3	Mass.	Pa.	Wash.	Fla.	Ohio
4	Conn.	Tex.	N.J.	N.Y.	Mich.
5	Md.	Ill.	N.Y.	Del.	Pa.
6	N.Y.	Ohio	Mass.	Mass.	Calif.
7	Del.	Mich.	Mich.	Mich.	Conn.
8	Pa.	N.J.	Pa.	Conn.	N.C.
9	Ohio	Fla.	Conn.	S.C.	Ind.
10	Ill.	Mass.	Va.	Md.	Tex.

1/ From (34).

2/ From (27, 1975).

Source: (15).

about three-fourths of all farms reporting sales of \$2,500 or more fall into this category, only 8 percent of them produce commodities likely to be sold directly to the consumer. The locational limitations further reduce this number so that only about 3 percent of farms with sales over \$2,500 could benefit from direct marketing programs. The value of production from these potential beneficiaries is estimated at about 0.5 percent of the total value of all agricultural production. Nevertheless, the improvement of opportunities for direct marketing could improve the well-being of some moderate-size farms and permit consumers in those locations to shop in a more competitive environment.

A recent analysis of the potential impacts of direct marketing on small fruit and vegetable farms in California concluded that direct-marketing policies will have an almost imperceptible impact on the overall distribution of sales and net income between large and small farms in that State (14). That is so mainly because direct marketing does not provide market access to enough small farmers. The authors of the report state: "In short, direct-marketing policies can be no general panacea for the vast majority of small fruit and vegetable farms let alone the even larger number of small farmers who produce other kinds of crops which are not amenable to direct marketing."

The results of the California study are likely to be valid for most other areas of the Nation as well. So, although direct marketing may be a valuable market outlet for properly situated individual small farmers, it is far from being a solution for most farms with eroding markets, small-scale operations, or low returns. The findings of the California direct-marketing study suggest that small farms might be served better by devoting more attention to policies and programs designed to increase the small producer's access to the conventional marketing system.

## COMMODITY PROGRAM IMPACTS ON THE FARM SECTOR

Agricultural commodity programs clearly rank among the more important public programs that affect the farm economy and the structure of that economy. They also significantly affect many factors in the national economy--the allocation of resources, the location of population and industry, exports and the balance of trade, the budget deficit, consumer food prices and expenditures, the rate of inflation, and so on. The major impact of these programs is determined by the distribution of benefits, raising the questions of "who gets the subsidies?" and "what effect does this have on the structure of farming?"

The aim of major commodity programs has been primarily to increase and stabilize farm incomes, although there are other objectives. Consumers benefit by having adequate supplies and more stable prices. Program benefits accrue to the participants directly through payments and supported prices, and indirectly through higher market prices. Nonparticipants also benefit indirectly from the higher prices. Previous studies, however, have shown program benefits to be distributed unevenly, with most going to the largest farmers (2, 25). Those studies are now outdated, since programs have been significantly changed by subsequent legislation and the farm sector has further evolved. This study updates and expands upon the previous studies.

The following are summarized conclusions about the major impacts of the distribution of commodity program benefits in 1978.

- . The 1978 farm program increased net returns to participating farmers, but the benefits favored larger producers because payments were related to individual farm size and acreages planted.
- . About one-third of all farmers (750,000) participated in the 1978 programs; the rate of participation was higher for larger farms.
- . The average farm size was larger for program participants than for nonparticipants.
- . Less than 10 percent of the total acreage in the 1978 farm program was controlled by corporations. Only 0.2 percent of the enrolled acreage was on widely held corporate farms.
- . \$2 billion were disbursed in program payments, the largest amount since 1973.
- . Almost half the payments went to only 10 percent of the participants, those with the largest farms. By contrast, 50 percent of the farms--the smaller units--received only 10 percent of the payments.
- . The proportion of payments received by the largest farms differed by commodity. The cotton program had the highest degree of concentration; feed grain was the most evenly dispersed.
- . About 1,200 participants (0.2 percent of the 750,000 participants) were affected by payment limitations. Payments foregone because of the limits amounted to \$24 million, 1.4 percent of the total payments.
- . Higher commodity prices as a result of acreage controls increased returns to participants by about \$900 million, almost half the direct program payments.

- . Net benefits averaged \$267 for the smallest program participants, those who have a normal crop acreage (NCA) less than 70 acres. Net benefits were more than \$44,000 for the largest participants, those who have 2,500 acres.

These findings reinforce those of earlier studies. It is likely that the 1978 program benefits brought higher farmland values that benefited existing landowners and further contributed to the escalating capital requirements for beginning farmers--a barrier to entry. Over time, the programs probably increase capital requirements and tend to put renters at a disadvantage and further impede the entry of young farmers.

### Commodity Programs

The Food and Agriculture Act of 1977 continued, with modification, programs that provide price and income supports to producers of the major crops--wheat, feed grains, cotton, and rice. 5/ Price support is affected through nonrecourse loan programs. Farmers may secure loans from the Government by pledging the commodity as collateral. The Government takes title to the commodity if the loan is not repaid, with no further recourse to the borrower. Income support is provided through the target price, deficiency payment concept. Farmers receive direct payments from the U.S. Treasury when market prices fall below the established target level. Producers prevented from planting, or experiencing low yields due to natural hazards, may also receive payments computed as a fraction of the target price. The price support (loan rates), income support (target prices), and the payment rates per unit for 1978 are shown in table 10.

Producers become eligible for the commodity program benefits by complying with acreage set-aside requirements, if any, and by limiting their total plantings of specified crops--the planted acres plus the acreage set aside may not exceed the farm's normal crop acreage (NCA). 6/ A further restriction is the cross-compliance provision which requires a farmer to comply with the set-aside for all crops to be eligible for commodity program benefits for any crop. An added provision of the 1978 programs allowed producers of some crops to divert acreage voluntarily from these crops to conservation practices in return for payment (table 11).

A major change in the 1977 act was replacement of the long standing acreage allotments, derived from production patterns several decades old, with a current plantings concept. This, in effect, updated the base for computing program benefits and set-aside acreage requirements for all commodities except rice (where old acreage allotments were retained). The total payment a farmer receives is based upon the production from an eligible acreage. That acreage is determined by multiplying the acreage planted for harvest by the allocation factor for that crop (the program allocation factor is the ratio of the national program acreage--the estimated acreage needed to meet domestic consumption and export sales plus adjustments in domestic stocks--to the estimate of harvested acreage). The allocation factors in 1978 ranged

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5/ See (13) for a description of the provisions of the 1977 act.

6/ Crops subject to the total acreage restriction are barley, corn, dry edible beans, flax, oats, rice, rye, sorghum, soybeans, sugarbeets, sugarcane, sunflowers, upland cotton, wheat and any other crops recommended by the State agricultural stabilization and conservation committees and approved. The normal crop acreage of a farm refers to the acreage normally planted to the crops specified above. In a State like Nebraska, the NCA accounted for 62 percent of the total cropland and 43 percent of the total farmland in 1974. States in the Corn Belt generally have NCAs that account for a much larger percentage of the total cropland. California, with its diverse agriculture, has an NCA that accounts for a smaller percentage of the total cropland and farmland.

Table 10--Market and program elements used to calculate commodity deficiency payments, 1978

Commodity	Unit	Target price	Loan rate	Average price <u>1/</u>	Deficiency payment rate	Allocation factor <u>2/</u>
		<u>Dollars per unit</u>				<u>Percent</u>
Barley	Bu.	2.25	1.63	1.90	0.35	82.4
Corn	do.	2.10	2.00	2.07	.03	97.1
Cotton	Lb.	.52	.48	.55	0	--
Rice	Cwt.	8.53	6.40	7.75	.78	--
Sorghum	Bu.	2.28	1.90	1.95	.33	95.8
Wheat	do.	3.40	2.35	2.88	.52	100.0

-- = Not applicable.

1/ The national weighted average price in the first 5 months of the marketing year for each commodity, except cotton, for which the calendar year average price is used.

2/ The program allocation factor is the ratio of the national program acreage (the estimated acreage needed to meet domestic consumption and export sales plus adjustments in domestic stocks) to the estimate of harvested acreage.

Source: Agr. Stab. Conserv. Serv., U.S. Dept. Agr.

Table 11--Acreage set-aside requirement and allowable voluntary diversion, by crop, 1978

Commodity	Proportion of acreage planted for harvest	
	Required set-aside	Voluntary diversion
	<u>Percent</u>	
Barley	10	10
Corn	10	10
Cotton	0	10
Rice	0	0
Sorghum	10	10
Wheat	20	0

from 82.4 percent for barley to 100 percent for wheat. However, feed grain producers could gain eligibility for deficiency payments on all their planted acreage of corn, sorghum, and barley by voluntarily reducing their 1978 plantings of corn and sorghum by 5 percent and barley by 20 percent from the 1977 planted acreage, in addition to the required set-aside. 7/

Payments to rice growers continued to be based on production from the allotted acreages, but there was no limitation on the total acreage that could be planted. However, production on acreage in excess of the allotment (and on farms without allotments) was not eligible for price-support loans or deficiency payments.

The 1977 act continued the payment limitation, in effect since 1971, but changed the limit. The new limit of \$40,000 applied to the combined deficiency and diversion payments a person may receive from the wheat, feed grain, and upland cotton programs in 1978. Payments from the rice program were not included in this limit, and a separate maximum of \$52,250 per person was established for that program.

There were 2.4 million farms in 1978, as estimated by ESCS' Crop Reporting Board. 8/ The Agricultural Stabilization and Conservation Service (ASCS), the USDA agency responsible for administering the commodity programs, also defines farms for program administration purposes. There were 2.3 million ASCS farms in 1978. 9/ Each ASCS farm may have more than one producer associated with it, resulting from leasing arrangements, partnerships, and the like. Conversely, one producer may have shares of commodity production in more than one ASCS farm. To gain information on the complete farming operation associated with the producer and to facilitate an analysis of the impacts of the payment limitation, the size of farm is expressed in terms of the producer's normal crop acreage. This includes any proportional share of the acreage on farms for which more than one producer has an interest.

### Participation

There were about 750,000 farmers (about one-third of the total number of farms, including both farm operators and landowners), who participated in the major commodity programs in 1978. These participating farms grew nearly 100 million acres of the six program crops, and produced 36 percent of the total output of these crops (table 12).

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7/ Another major provision of the 1978 commodity programs, not treated in this report, was the farmer-owned grain reserve program. Farmers who complied with the set-aside requirements in 1978 were also eligible to place their grain in this program. The grain was first put under loan. Then a contract was made in which the farmer agreed to hold the grain until the market price reached a specified percentage of the loan rate. In return, farmers received a payment for storing the grain, and interest on the loans is waived after the first year of the contract. Over 400 million bushels of wheat and nearly 900 million bushels of feed grains were in the farmer-owned reserve on Sept. 30, 1978. Most of this grain was from crops prior to the 1978 harvest.

8/ ESCS generally uses the Census Bureau concept of a farm as a place which has sales receipts of more than \$1,000. This definition was adopted in 1978. The former definition used \$250 as the sales limit, which would result in a total of 2.7 million farms.

9/ An ASCS farm consists of tracts of land that are being operated by one person with cropping practices, equipment, labor, accounting system, and management substantially separate from that of any other farming unit that may be operated by the same person.

Table 12--Participation in 1978 farm commodity programs, by commodity and region

Commodity	U.S.		Northeast		North Central		South		Plains		Southwest		Northwest	
	Partic- ipants	Acreage	Partic- ipants	Acreage	Partic- ipants	Acreage	Partic- ipants	Acreage	Partic- ipants	Acreage	Partic- ipants	Acreage	Partic- ipants	Acreage
	Number	1,000 acres	Number	1,000 acres	Number	1,000 acres	Number	1,000 acres	Number	1,000 acres	Number	1,000 acres	Number	1,000 acres
Barley	78,467	6,077.8	1,949	47.0	1,056	779.6	2,279	96.8	49,565	3,720.9	4,827	273.4	10,928	1,160.10
Corn	401,349	32,891.0	16,450	952.2	207,858	19,099.1	67,463	2,815.6	107,046	9,805.1	1,803	167.3	910	57.70
Cotton	50,445	6,385.3	--	--	2,955	160.8	16,622	1,346.8	26,604	4,179.2	4,238	698.5	--	--
Hay, grazing	21,597	925.1	71	.5	708	22.4	1,183	20.4	18,959	843.6	439	28.2	229	9.70
Rice	16,577	1,375.5	--	--	70	6.1	16,505	1,369.2	2	.1	--	--	--	--
Sorghum	140,550	9,660.6	76	1.5	13,669	499.9	5,344	175.2	118,742	8,639.4	2,697	344.5	2	.05
Wheat	387,341	41,818.3	4,440	90.0	71,574	3,302.0	11,081	353.6	272,275	33,072.0	4,791	1,324.9	17,180	3,675.0
Total	739,105	99,133.7	16,974	1,091.4	233,357	23,870.0	99,372	6,178.1	358,288	60,260.5	11,174	2,566.8	19,940	5,166.80

-- = Not applicable.



Participation was concentrated in the Plains and North Central regions; 80 percent of all participants were in these regions (fig. 3). The Plains region not only had the most participants and enrolled acreage, it also had the highest proportion of all farms enrolled in the programs (fig. 4). Farmers in the Plains States have traditionally participated heavily in the programs. The major crop in this region is wheat. Producers generally expected the target price (\$3.40 per bushel) to be higher than market prices and thus receive a substantial payment from the program. Further, the provisions of the barley and sorghum programs, crops also grown by many wheat producers, were relatively attractive. Participation in the wheat program was necessary to obtain benefits from the barley and sorghum programs because of the cross-compliance requirement previously mentioned.

Participation in the North Central region was relatively low because the potential benefits from the corn program were lower than for other crops. The maximum payment rate could be only 10 cents--the differential between the \$2.10 target price and the \$2 loan rate. Participation in the cotton program was large because there was no set-aside requirement. Hence, producers only had to meet any applicable cross-compliance requirements to be in compliance.

Participants are predominantly sole proprietorships and partnerships. For all six program crops, less than 10 percent of the enrolled acreage was on farms operated by corporations (table 13). And the majority of this acreage belonged to closely held (predominantly family) corporations (fewer than 16 stockholders). The enrolled acreage on widely held corporations (16 or more stockholders) was a negligible 0.2 percent (table 14).

The participation rates between corporate and noncorporate farms were not drastically different. The exception was the cotton program in which corporate farm participation was relatively low. This is not surprising, since most of the large corporate cotton farms are in the Southwest. The extensive use of irrigation there substantially reduced production risks, making program benefits less attractive. In fact, the rate of participation in the cotton program in this region (61 percent of all ASCS farms) was relatively low (fig. 5).

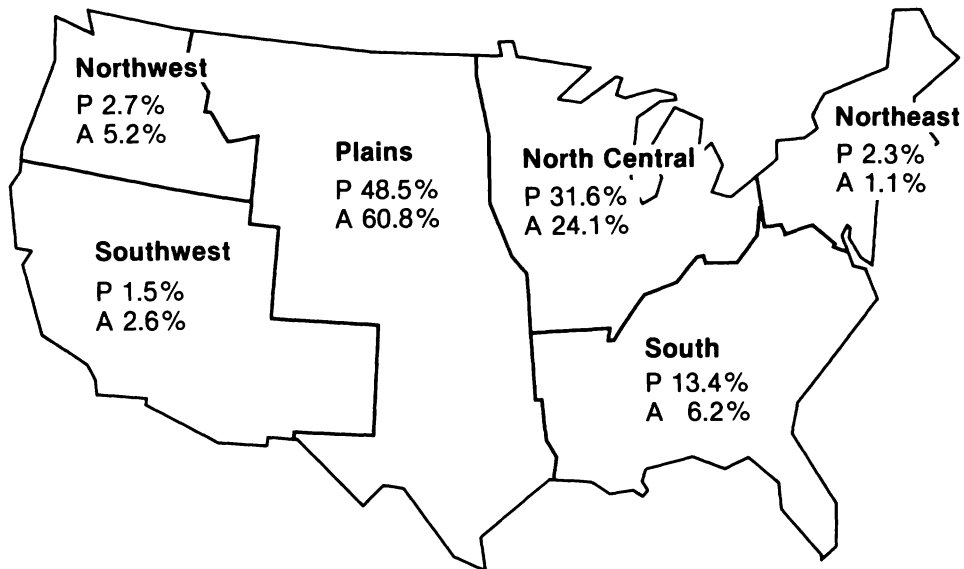
Program data indicate that the size distribution of program participation generally follows the distribution of production--a small proportion of the farms accounts for a large proportion of the enrolled acreage and the total production (table 15).

The programs were apparently more attractive to the large farms. Only 35 percent of the total ASCS farms participated, but they accounted for 53 percent of the total normal crop acreage. This indicates that the average farm size (in terms of the NCA) was about twice as large for participants as for nonparticipants. Further, the data imply a larger proportion of all large farms participating than all small farms.

Figure 3

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### Regional Breakdown of 1978 Farm Program Participants (P) and Enrolled Acreage (A)



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Figure 4

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### Percentage of Regional ASCS Farms (F) and NCA Acreage (A) Enrolled in 1978 Farm Programs

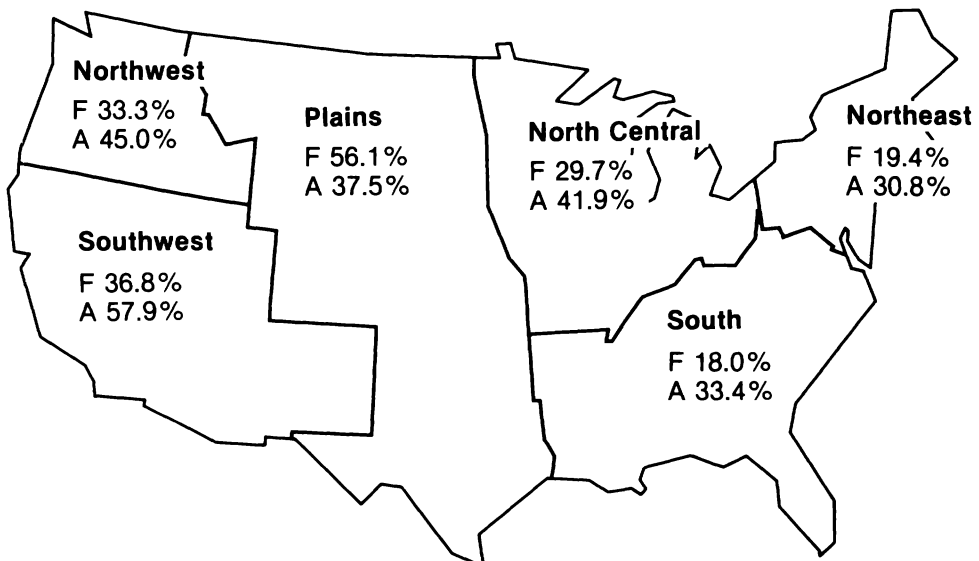


Table 13--Corporate and noncorporate farm participation in commodity programs

Commodity	All farms			Noncorporate farms			Corporate farms		
	Planted acreage	Enrolled acreage	Rate of partici- pation <u>1/</u>	Planted acreage	Enrolled acreage	Rate of partici- pation <u>1/</u>	Planted acreage	Enrolled acreage	Rate of partici- pation <u>1/</u>
	--1,000 acres--		Percent	--1,000 acres--		Percent	--1,000 acres--		Percent
Barley	9,297	5,969	64.2	8,212	5,297	64.5	1,079	672	62.3
Corn	69,793	32,733	46.9	75,982	30,545	40.2	4,022	2,188	54.4
Cotton	12,289	10,372	84.4	10,581	9,470	89.5	1,692	902	53.3
Sorghum	14,252	10,532	73.9	13,476	9,959	73.9	781	573	73.4
Wheat	59,022	41,965	71.1	54,766	38,829	70.9	4,295	3,135	73.0
Total	164,653	101,571	61.7	163,017	94,100	57.7	11,869	7,470	62.9

1/ The percentage of enrolled acreage relative to the total acreage planted by both participating and nonparticipating farmers.

Source: (28).

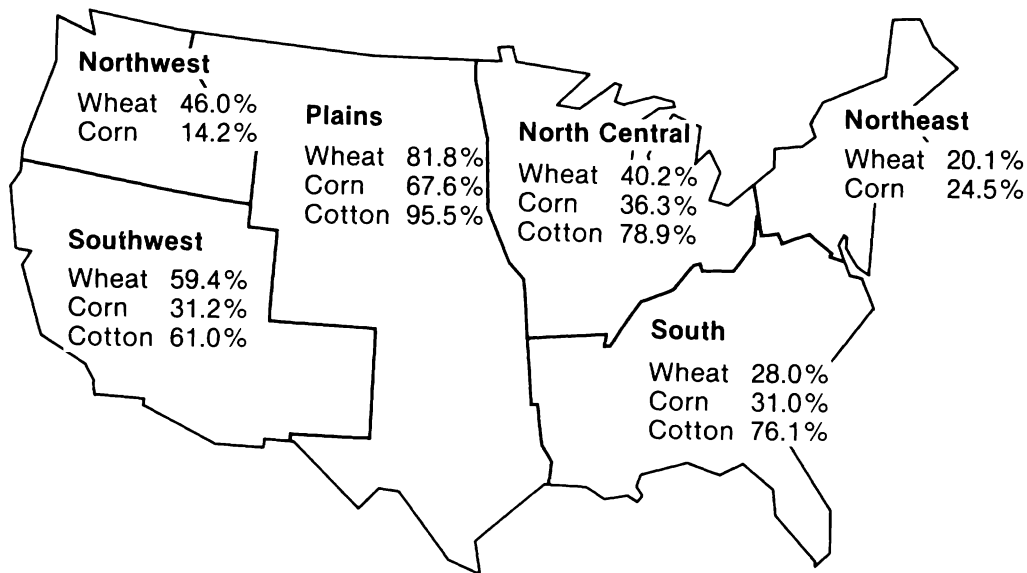
Table 14--Closely held and widely held corporate farm participation in commodity programs

Commodity	All corporate farms			Closely held corporations			Widely held corporations		
	Planted acreage	Enrolled acreage	Rate of participation <sup>1/</sup>	Planted acreage	Enrolled acreage	Rate of participation <sup>1/</sup>	Planted acreage	Enrolled acreage	Rate of participation <sup>1/</sup>
	--1,000 acres--		Percent	--1,000 acres--		Percent	--1,000 acres--		Percent
Barley	1,079	672	62.3	1,029	634	61.6	50	38	76.7
Corn	4,022	2,188	54.4	3,893	2,116	54.4	129	72	56.0
Cotton	1,692	902	53.3	1,637	879	53.7	55	23	42.2
Sorghum	781	573	73.4	756	557	73.7	25	16	64.9
Wheat	4,295	3,135	73.0	4,199	3,075	73.2	96	60	62.7
Total	11,869	7,470	62.9	11,514	7,261	63.1	355	209	58.9

<sup>1/</sup> Percentage of enrolled acreage relative to the total acreage planted by both participating and nonparticipating farmers.

Source: (28).

## Percentage of Regional Crop Acreage Enrolled in 1978 Farm Programs



### Distribution of Program Benefits 10/

There are several ways to view the distribution of the commodity program benefits: number of recipients, size of farm of recipients, commodity produced, and geographic region.

#### Number of Recipients

Program participants totaled 750,000, approximately one-third of all farmers. Program benefits are generally based on production volume (bushels or pounds), so it would not be expected that payments would be distributed equally among participants. Rather, the benefit distribution logically would correspond to the size distribution of the acres enrolled. The larger farms have more acreage, hence a higher volume of production and more benefits.

10/ This analysis is based upon the disbursement of 1978 program payments through February of 1979. Disbursed payments to that date totaled \$1.75 billion for the various programs (below). Since that date, further disbursements have increased the total to \$2.0 billion (through June of 1979). The additional payments were largely for the disaster programs.

Most of the additional disbursements were not to farms recorded as already receiving payments, but to farms not previously on file. Thus, the general pattern of distribution of payments as reported in this section would remain unchanged, even though the absolute payment levels are understated.

Table 15--Participation in 1978 farm commodity programs by size of producer (based on normal crop acreages--NCA)

Commodity	Unit	Less than 70 NCA		70-219 NCA		220-499 NCA		500-1,499 NCA		1,500-2,499 NCA		2,500 NCA & over		All sizes	
		Producers	Acres (1,000)	Producers	Acres (1,000)	Producers	Acres (1,000)	Producers	Acres (1,000)	Producers	Acres (1,000)	Producers	Acres (1,000)	Producers	Acres (1,000)
Barley	No.	17,037	212.6	22,789	791.3	20,707	1,501.3	15,728	2,517.4	1,596	570.7	610	484.4	78,467	6,077.8
	Pct.	1/21.7	2/3.5	29.0	13.0	26.4	24.7	20.1	41.4	2.0	9.4	.8	8.0	--	100.0
Corn	No.	144,771	2,429.5	146,830	8,697.7	76,515	10,589.5	30,158	8,813.2	2,254	1,502.4	812	858.8	401,349	32,891.0
	Pct.	36.0	7.4	36.6	26.5	19.1	32.2	7.6	26.7	.5	4.6	.2	2.6	--	100.0
Cotton	No.	20,224	306.4	12,938	757.0	8,346	1,176.5	7,271	2,494.6	1,146	858.7	520	792.2	50,445	6,385.3
	Pct.	40.1	4.8	25.6	11.8	16.6	18.4	14.4	39.1	2.3	13.5	1.0	12.4	--	100.0
Hay and grazing	No.	6,108	72.6	6,542	171.2	4,988	227.8	3,441	309.8	393	80.2	173	63.4	21,645	925.0
	Pct.	28.2	7.8	30.2	18.5	23.0	24.6	15.9	33.5	1.8	8.7	.8	6.9	--	100.0
Rice	No.	7,736	74.1	3,645	206.1	2,953	379.9	1,894	501.6	240	109.9	111	104.0	16,577	1,375.5
	Pct.	46.7	5.4	21.9	15.0	17.8	27.6	11.5	36.5	1.4	7.9	.7	7.6	--	100.0
Sorghum	No.	52,503	730.1	44,371	1,851.6	26,978	2,441.0	14,291	3,014.8	1,653	816.9	754	806.4	140,550	9,660.6
	Pct.	37.4	7.6	31.6	19.2	21.2	25.3	10.2	31.3	1.1	8.5	.5	8.4	--	100.0
Wheat	No.	134,379	2,330.0	120,321	6,533.1	80,071	10,834.3	46,594	15,888.9	4,364	3,628.5	1,612	2,603.6	387,341	41,818.3
	Pct.	34.7	5.6	31.1	15.6	20.6	25.9	12.1	38.0	1.1	8.7	.4	6.2	--	100.0
Total	No.	291,932	6,155.2	240,830	19,007.1	132,708	27,150.3	65,462	33,540.1	5,975	7,567.0	2,198	5,712.7	739,105	99,133.7
	Pct.	39.5	6.2	32.6	19.2	18.0	27.4	8.9	33.8	.8	7.6	.3	5.8	--	100.0

-- = Not applicable.

1/ Proportion of all producers in size group participating in the 1978 farm commodity program.

2/ Proportion of total acreage enrolled in the 1978 farm commodity program.

## Type of Payment:

Payments as of:  
February (this study)      June 28, 1979

Million dollars

Deficiency payments	990	1,021
Voluntary diversion payments	590	633
Disaster payments	162	356
Haying and grazing payments	12	15
	<u>1,754</u>	<u>2,025</u>

Volume of production (and payments) is skewed toward the larger farms, while the number of participating farms is skewed toward the smaller farms. Almost three-fourths of all program participants had an NCA of less than 220 acres. The next largest size group, those with an NCA of 220 to 1,499 acres, comprised just over one-fourth of the participants. The very largest farms, those with an NCA of 1,500 acres and more, made up only 1 percent of all recipients. However, the share of the total payments going to these groups is inverse to the numbers in each group.

While payments are based on volume, participation requirements are generally in acreage terms. So the proportion of payments received by each group corresponds closely to the acreage enrolled in the program. The distribution of participants, acreage enrolled, and payments received among the farm groups are summarized below.

- . The smallest producers, 72 percent of the participants (533,000), enrolled 25.4 percent of the acreage and received 25.8 percent of the total payments, or \$454 million.
- . Midsize producers, 27 percent of the participants (198,000), enrolled 61.2 percent of the acreage and received 62 percent of the total payments, or \$1.09 billion.
- . The largest producers, 1 percent of the participants (8,200), enrolled 13.4 percent of the acreage and received 12.2 percent of the total payments, or \$214 million.

These data reaffirm what is widely known about the programs--that benefits are closely proportional to production volume (acreage); that the larger farms, although few in number, have the highest production volume (acreage) and thus receive a disproportionate share of the program benefits.

Distribution by Size of Farm

The distribution of payments by participants' NCA acreage size, by region, is shown in table 16. The participating farms are grouped by percentiles, ascending from the smallest farms to the largest farms. These data reveal the following information.

- . The 50 percent of the participants (375,000) with the smallest farms received less than 10 percent of the total payments, an average payment per participant of \$460.
- . The 50 percent of the participants with the largest farms received over 90 percent of the payments, an average per participant of \$4,280.
- . The largest 10 percent (75,000) received nearly half the total payments, an average per participant of \$10,900.

Table 16--Distribution of 1978 program payments, by region

Region	Percentile of producers <sup>1/</sup>								Payments received
	Smallest indicated percentage:				Largest indicated percentage:				
	10	20	30	50	50	30	20	10	
	Percentage of payments								Mil. dollars
Northeast	1.0	2.2	4.5	12.2	87.8	74.5	62.8	43.0	24.2
North Central	.9	2.0	4.9	13.5	86.5	71.5	58.7	40.8	496.4
South	.2	.4	1.3	7.0	93.0	82	71.5	51.5	140.0
Plains	.5	1.2	2.8	10.5	89.5	76	63.8	45.8	1,200.3
Southwest	.9	1.1	2.0	8.0	92.0	79.1	67.0	47.5	83.9
Northwest	.8	1.2	2.5	7.7	92.3	80.4	67.7	47.5	79.9
United States	.9	1.9	3.7	9.7	90.3	77.5	65.4	46.0	2,024.7

<sup>1/</sup> The percentiles are ranked by size of recipients' NCA. For example, the smallest 10 percent of producers simply refers to 10 percent of participants who had the smallest NCA.

The average payment per participant ranges from \$365 for farms that have an NCA of less than 70 acres to \$36,000 for the farms that have an NCA of at least 2,500 acres. Participants with an NCA of less than 220 acres received an average payment of \$852, while those with an NCA of over 1,000 acres received \$18,790.

These data again confirm the findings of previous studies--that the largest proportion of the payments are received by a relatively small number of the largest producers.

#### Distribution by Commodity

About 95 percent of total program payments were for the wheat (42 percent) and feed grain (55 percent) programs. The pattern of wheat program payments among producer sizes was very similar to that for the total program payments. The feed-grain program payments were somewhat more evenly distributed (fig. 6). Cotton showed the greatest concentration of payments among the largest producers (table 17).

#### Distribution by Region

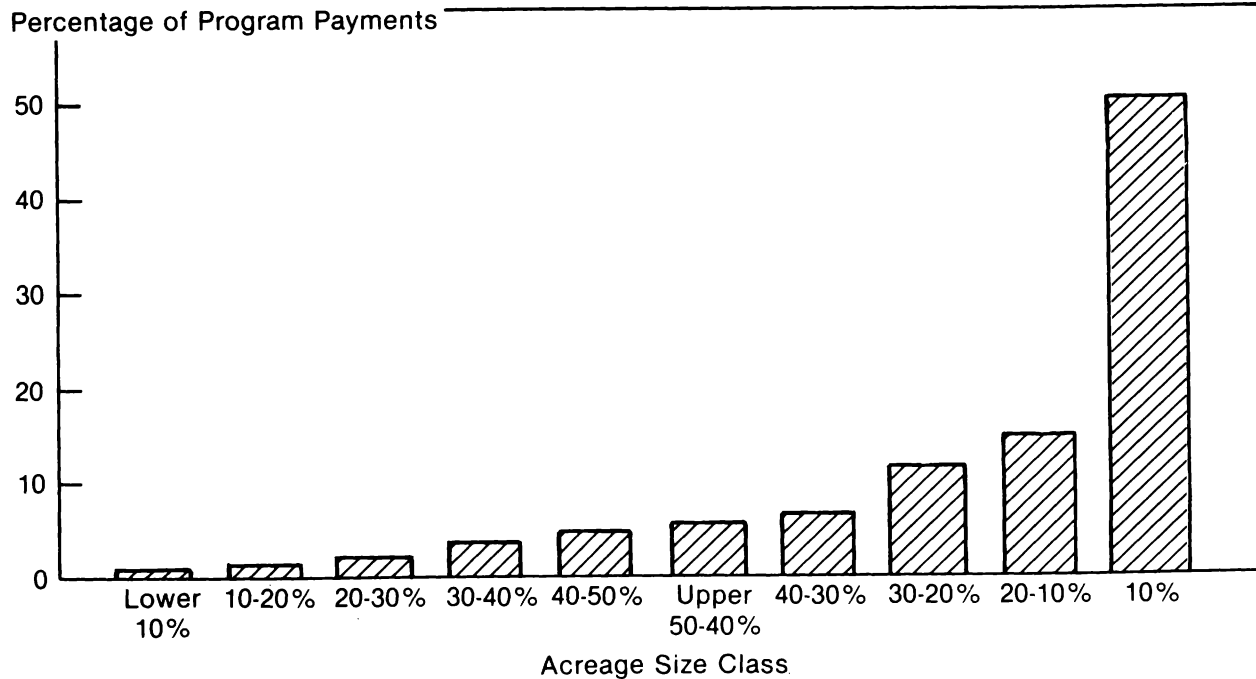
The North Central and Plains regions received about 85 percent of the total program payments reflecting their dominance in wheat and feed grain production. The concentration of program payments to larger producers was the highest in the South and the lowest in the North Central region. This is consistent with the pattern of payment distribution among commodities, since the South is a primary cotton area while the North Central is the primary feed grain area.



Figure 6

## Distribution of 1978 Wheat and Feed Grain Payments by Size of Normal Crop Acreage

### Wheat



### Feed Grain

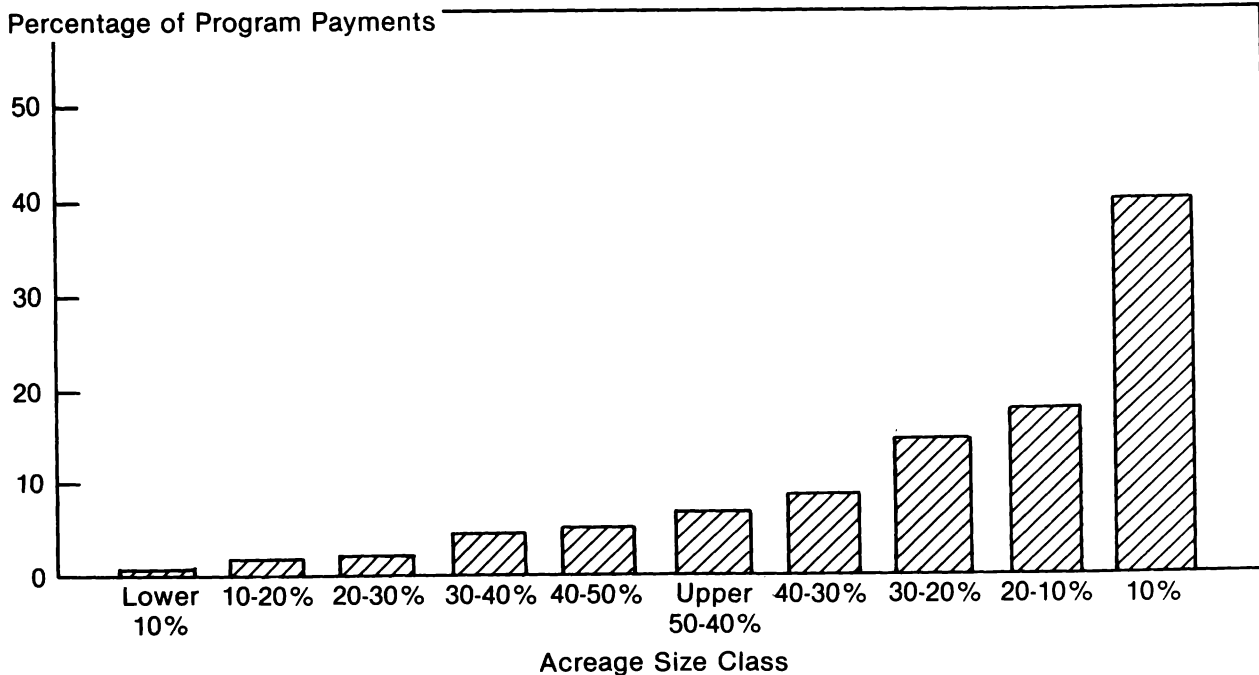


Table 17--Distribution of 1978 program payments, by commodity

Commodity	Percentile of producers <sup>1/</sup>							
	Smallest indicated percentage				Largest indicated percentage			
	10	20	30	50	50	30	20	10
	Percentage of payments							
Wheat	0.8	1.8	3.4	10.9	89.1	76.6	66.6	50.0
Cotton	.2	.9	1.4	6.20	93.8	83.3	72.5	53.3
Rice	.8	1.5	1.8	7.0	93.0	77.4	63.2	39.8
Feed grain	.5	2.5	4.1	13.3	86.7	70.0	57.1	39.5
U.S. total	.9	1.9	3.7	9.7	90.3	77.5	65.4	46.0

<sup>1/</sup> The percentiles are ranked by size of recipients' NCA. For example, the smallest 10 percent of producers simply refers to 10 percent of participants who had the smallest NCA.

#### Impacts of the Payment Limitation

There were 1,184 producers (0.2 percent) of the 750,000 participants affected by the payment limitation of \$40,000 for the wheat, feed grains, and cotton programs combined, and the limit of \$52,250 for rice. Payments foregone because of the limits amounted to \$24 million, 1.4 percent of the total disbursement and an average of about \$20,000 for each of the affected producers.

The \$24-million payment reduction likely understates the total impact of the limitation. Its mere existence is no doubt a factor causing some large farming units not to participate in the programs.

Most of those affected by the limitation were wheat growers; one-half of those affected were located in the Plains region and one-fourth in the Northwest. The limitation had virtually no impact on participants with an NCA of less than 1,000 acres.

#### Market-Related Impacts

Benefits of commodity programs to producers are of two types--those direct to the farmer in cash payments and those that accrue through the collective supply-restricting action that increases market prices. The 1978 programs improved commodity market conditions through the acreage reduction (set-aside and diversion) provisions. The benefits from higher market prices accrue, of course, both to program participants and nonparticipants. Supply controls increased prices an estimated 3 percent for cotton, 4 percent for sorghum, 6 percent for corn, 8 percent for barley, and 14 percent for wheat. In addition, there were cross-price effects on some nonprogram commodities. As the prices of program commodities rose, the demand for substitute commodities increased. For instance, soybean prices were an estimated 2 percent higher as a result of the supply controls on the other crops.

These estimates of market-price benefits from the programs were computed for farms of the various sizes by combining the information about participants (farm-size distribution) with the price impacts noted above. The income foregone on acreage set-aside or diverted was also taken into account in order to derive net benefits. The results suggest the indirect price benefits for participants amounted to about one-half as much as the direct program payments (table 18). Indirect benefits to nonparticipants who did not forego income on set-aside or diverted acres would be additional.

The impacts on net returns by size of farm were similar to the distribution of payments. Participants with an NCA of less than 70 acres had average net benefits of \$267. The relatively small amount reflects their small volume of production. At the other end of the scale, participants with an NCA of 2,500 acres or more received average net benefit of about \$44,000. Overall, the 1978 commodity programs resulted in an estimated net increase in returns (after deducting the income foregone on set-aside acres) of \$1.5 billion for participants. That was equivalent to about 5 percent of net farm income in 1978 and 85 percent of total direct payments.

On a per-acre basis, the payments and indirect price benefits were approximately the same for large and small farms. However, benefits tended to be small for participants in the feed-grain programs who had a higher foregone income for each set-aside acre. In addition, set-aside was not required for cotton for which the average farm size is higher. The average net benefit derived from the commodity programs amounted to an estimated \$13 per enrolled acre for the smallest participants (less than 70 acres NCA) and \$17 per acre for the largest participants (2,500 acres NCA and over).

In general, distribution of net program benefits closely follows the pattern of production distribution. The lowest 10 percentiles of the participants, for example, received about 1 percent of the program net benefits and accounted for the same percentage of the commodity production. The ratio of the share of net benefits to the share of production ascends along the size of farm (NCA), as shown in table 19. This suggests that the distribution of net benefits is skewed toward large producers, not only because of the associated large sales volume, but also commodity composition and the higher rates of participation.

## STRUCTURAL CHANGES IN THE CATTLE-FEEDING INDUSTRY

The U.S. cattle feeding industry has undergone structural changes that are consistent with changes in other agricultural sectors in some ways but unique in others. These changes typify the evolution that has taken place in U.S. agriculture and help explain the status of today's family farm.

The cattle feeding industry of 30 years ago could be characterized as follows.

- . Having large numbers of small feedlots (under 1,000-head capacity, with many much smaller).
- . Being located primarily in the Corn Belt as supplementary enterprises on grain farms.
- . Using unpaid and otherwise underutilized family labor in off-season.
- . Feeding corn produced on the farm.
- . Producing most of the Nation's grain-fattened beef by feeding one-fifth to one-fourth of the calf crop (the rest being sold as nonfed beef).

Table 18--Impact of 1978 farm program on participant's cash flow, by size of farm

Impact	NCA acres										Total/ average all producers
	Less than: 70	70- 139	140- 219	220- 259	260- 499	500- 999	1,000- 1,499	1,500- 1,999	2,000- 2,499	2,500 & over	
<u>Million dollars</u>											
Changes in receipts, all participants:											
Payments <u>1/</u>	105.9	163.0	185.0	85.9	408.6	414.4	177.1	88.2	46.3	79.1	1,753.5
Plus indirect price benefits	56.8	85.0	94.4	44.0	210.7	216.1	90.0	44.0	23.0	48.4	912.4
Minus income foregone on set- aside acres	85.5	144.8	162.2	71.8	301.2	231.7	77.6	35.9	17.4	30.1	1,158.2
Net increase <u>2/</u>	77.2	103.2	117.2	58.1	318.1	398.8	189.5	96.3	51.9	97.4	1,507.7
<u>Dollars</u>											
Changes in receipts, per participant:											
Payments	365	1,109	1,972	2,684	4,058	7,819	14,282	21,000	27,235	35,955	2,372
Plus indirect price benefits	195	578	1,012	1,375	2,092	4,077	7,258	10,476	13,529	22,000	1,235
Minus income foregone on set- aside acres	293	985	1,729	2,244	2,991	4,370	6,235	8,743	10,012	13,694	1,567
Net increase	267	702	1,255	1,815	3,159	7,526	15,305	22,733	30,752	44,261	2,040

1/ Based upon February 1979 data. The total level has since increased to \$2 billion due to additional farm receiving payments. The pattern of distribution remains valid although the absolute amounts are understated.

2/ Understated by a total of about \$250 million, as indicated in above footnote.

Table 19--Distribution of 1978 farm program net benefits and participants' production

Item	Percentile of producers <sup>1/</sup>					
	Smallest indicated percentage:			Largest indicated percentage		
	10	30	50	50	30	10
	Percentage of net benefits					
Programs net benefits	0.80	3.40	8.50	91.50	82.00	55.50
Commodity production	1.00	4.00	9.50	90.50	76.50	47.00
Ratio = share of net benefits to share of production	.80	.85	.89	1.01	1.07	1.18

<sup>1/</sup> The percentiles are ranked by size of recipients' NCA. For example, the smallest 10 percent of producers simply refers to 10 percent of participants who had the smallest NCA.

- . Selling primarily through local and terminal auctions in largely uncoordinated markets.

A very much changed industry exists today:

- . Having declining numbers of feedlots feeding many more cattle, with very large commercial feedlots predominant.
- . Being located primarily in the Southern and Central Plains.
- . Employing highly specialized skills and technology.
- . Using an industrial approach to management, financing, and marketing.
- . Having increased coordination between feeding and input markets, slaughter, and distribution.

Half the cattle fed now are in about 400 feedlots; one-third are fed in fewer than 171 feedlots (30). In contrast, the small farmer-feeder operations produced most of the fed beef prior to 1960. Several feedlot firms have a one-time capacity in excess of 100,000 feeder cattle. Since cattle are generally fed for less than 6 months before being moved to market, a 100,000-head feedlot can produce more than 200,000 head per year.

There was a substantial increase in the aggregate annual feedlot capacity in the sixties and early seventies. The number of fed cattle marketed increased almost 80 percent between 1962 and 1972 while the number of feedlots decreased by 33 percent (10, 30). On the average, more than 1 million additional cattle were fed each year during this period, while feedlots decreased by more than 7,500 each year. Small feedlots of less than 1,000-head capacity declined in number each year while large commercial feedlots increased by about 60 lots annually.

The increase in feeding capacity has been associated with large lots. Over 61 percent of the fed cattle marketed in 1964 were from 223,000 feedlots with a capacity of less than 1,000 head. Small feedlot numbers decreased to 130,000 and accounted

for less than one-third of the fed cattle marketed in 1977. On the other end of the size spectrum, 38 percent of the cattle were fed by the 200 largest feedlots in 1977 (table 20). Although small feedlots are still important in terms of total beef produced, the production of fed cattle is rapidly becoming more concentrated.

The Southern Plains accounted for nearly all the growth in cattle feeding since 1955. It was the major cattle feeding area in 1977 (fig. 7), accounting for 44 percent of all fed cattle marketed. The Corn Belt accounted for about 20 percent of marketings that year. In terms of absolute numbers, more cattle were fed in the Corn Belt in 1977 than in 1955, but the region has not shown major growth and development.

### Characteristics of Feedlot Operations

Cattle feedlot operations may be divided into two basic types--the traditional farmer-feeder and the large commercial feedlot operation (10). The size that delineates the two is somewhat arbitrary, but most farmer-feeders operate with a capacity of less than 1,000 head. Many farmer-feeders feed less than 200 cattle, usually during the noncropping season, and raise most of their own feed. Feed and labor costs make up a high proportion of the total cost of feeding cattle. Consequently, the utilization of off-season labor, nonsalable roughage, and other low-cost cattle feeding inputs makes cattle feeding an attractive supplementary enterprise for many grain farmers.

The volume fed by farmer-feeders depends upon the price relationships between their alternative farm enterprises, off-season labor availability, and off-farm employment alternatives. The large farmer-feeders tend to operate on a year-round basis with more specialized feeding facilities.

Farmer-feeders are typically in the older cattle feeding areas (Corn Belt, Northern Plains, and Lake States), but are rapidly declining in numbers and in terms of their relative production. This is particularly true in the Northern Plains where large commercial feedlots are being established.

Large commercial feedlots represent a new technology in cattle feeding, being highly mechanized and efficient. Labor is specialized and professional nutritionists, veterinarians, and accountants are retained. Managers are well informed on national and local grain, cattle, and beef markets and can receive information on demand concerning specific buyer activities; many subscribe to commercial information services and prices. The large feedlot managers, or their buyers, are continuously in the market for feeder cattle on a broad geographic basis. They have current information on prices, sources of inputs, and the availability and feeding quality of cattle coming from different geographical areas during different seasons. They vary their feeding programs to take into account the age and weight of cattle placed on feed, kinds of feed available, and the finish or grade of beef desired. Feed milling equipment and feed formulation technology are capital intensive. Management is aided by a detailed set of records kept for each lot of cattle.

Most of the largest commercial feedlots are incorporated, but a number of the moderate-size ones are not. Estimates developed from USDA and census data indicate 54 percent of all feedlots with 2,000-head capacity or more in 1974 were incorporated (30, 32). However, these incorporated feedlots accounted for 87 percent of all fed cattle marketed by all feedlots with 2,000 head or more capacity.

About 94 percent of all incorporated feedlots are closely held firms; 68 percent are owned by fewer than 6 shareholders, and 90 percent are owned by fewer than 11 shareholders. One or two shareholders constitute a majority of the ownership in 70 percent of these feedlots. More than three-fourths of all closely held incorporated

Table 20--Fed cattle marketed, feedlots, and cattle marketed per feedlot, by feedlot capacity groups

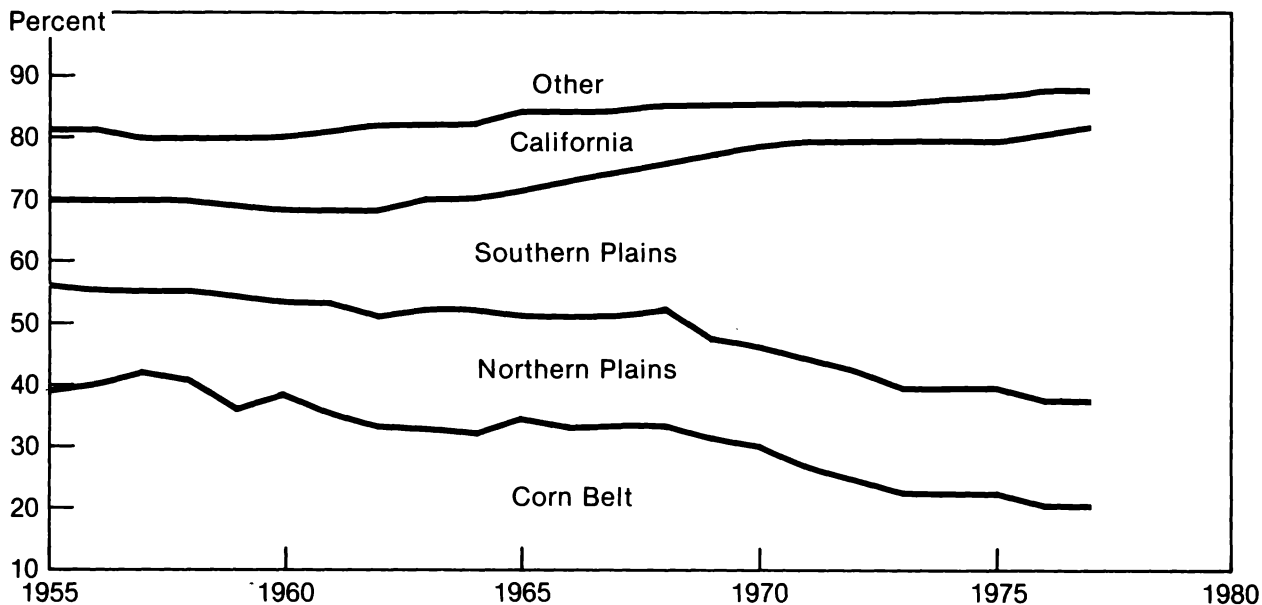
Feedlot capacity: (head)	Fed cattle marketed		Feedlots		Fed cattle marketed per feedlot
	Head	Percentage	Number	Percentage of total feedlots	
	<u>1,000</u>	<u>Percent</u>	<u>Number</u>	<u>Percent</u>	<u>Number</u>
1977:					
Under 1,000	7,927	31.9	130,049	98.60	61
1,000-1,999	1,176	4.7	819	.60	1,436
2,000-3,999	1,186	4.8	401	.30	2,958
4,000-7,999	1,653	6.6	238	.20	6,945
8,000-15,999	3,583	14.4	221	.20	16,213
16,000-31,999	4,846	19.5	140	.10	34,614
32,000 and over	4,490	18.1	61	.05	73,607
Total/average	24,861	100.0	131,929	100.00	188
1974:					
Under 1,000	8,261	35.4	135,810	98.60	61
1,000-1,999	981	4.2	747	.50	1,313
2,000-3,999	1,065	4.6	484	.40	2,200
4,000-7,999	1,541	6.6	258	.20	5,973
8,000-15,999	2,854	12.2	212	.20	13,462
16,000-31,999	4,174	17.9	148	.10	28,203
32,000 and over	4,458	19.1	73	.05	61,068
Total/average	23,334	100.0	137,732	100.00	169
1964:					
Under 1,000	11,094	61.1	223,071	99.30	50
1,000-1,999	1,043	5.7	826	.40	1,263
2,000-3,999	1,147	6.3	435	.20	2,637
4,000-7,999	1,377	7.6	244	.10	5,643
8,000-15,999	1,772	9.8	119	1/	14,891
16,000-31,999	1,153	6.4	36	1/	32,028
32,000 and over	558	3.1	8	1/	69,750
Total/average	18,144	100.0	224,739	100.00	81

1/ Less than 0.05 percent.

Source: (30).

Figure 7

## Fed Cattle Marketed, by Region, 1955-77



Southern Plains: Texas, Oklahoma, Kansas, Colorado, New Mexico.

Northern Plains: Nebraska, South Dakota, North Dakota.

Corn Belt: Iowa, Missouri, Illinois, Indiana, Ohio.

Source: (30).

feedlots involve related shareholders. Thus, most incorporated feedlots are closely held or family corporations. The widely held corporations accounted for about 7 percent of the cattle marketed in 1974, with most of these by lots having at least a 50,000-head capacity.

There were 23 feedlot firms with a one-time capacity of over 50,000 head in 1974. These firms fed 14 percent of all fed cattle that year. Analysis of limited information reported by the Census of Agriculture reveals that these large feedlot firms, when compared to smaller firms, had multiple feedlot operations, depended relatively little upon custom feeding, were more integrated with other agricultural operations, and frequently were more involved in activities not related to agriculture (table 21). More than 60 percent of the firms with 50,000 head capacity feedlot operations had nonfarm activities, two-thirds of them outside agriculture.

### Custom Feeding

The incorporated feedlots with a capacity of 12,000 to 49,999 head were heavily involved in custom feeding. <sup>11/</sup> These feedlots, which marketed 26 percent of the fed cattle in 1974, were generally closely held corporations (table 21).

<sup>11/</sup> Custom cattle feeding is where a feedlot performs the service of feeding cattle under agreement with individuals or other types of clients who own the cattle. The custom arrangements vary, but one typical arrangement is where the feedlot bills the cattle owner a basic charge, including a markup for each ton of feed plus a per-head charge for medication, dehorning, and other services (6). Few lots, if any, specialize solely in custom feeding.



Table 21--Characteristics of large corporate U.S. cattle feedlot firms, 1974

Item	Unit	One-time capacity of feedlot firm (head) <sup>1/</sup>			
		12,000-	20,000-	30,000-	50,000
		19,999	29,999	49,999	and over
Firms	Number	89.0	48.0	48.0	23.0
Fed cattle marketed (head)	Million	1.9	1.6	2.4	3.1
Proportion of all marketings	Percent	8.0	7.0	11.0	14.0
Parent corporations	do.	19.0	19.0	19.0	57.0
Public corporations	do.	7.0	10.0	8.0	44.0
Multiple-feedlot operations:					
More than one feedlot	do.	16.0	21.0	27.0	87.0
More than three feedlots	do.	3.0	10.0	2.0	48.0
More than five feedlots	do.	2.0	6.0	--	30.0
Nonfarm business activities	do.	17.0	25.0	17.0	61.0
Related to agriculture	do.	73.0	92.0	75.0	93.0
With farm input	do.	46.0	36.0	33.0	54.0
With processing	do.	64.0	27.0	17.0	62.0
With wholesaling or retailing	do.	27.0	6.0	67.0	46.0
With services and other	do.	18.0	27.0	--	--
Not related to agriculture	do.	60.0	33.0	38.0	64.0
Custom-feeding activities	do.	81.0	85.0	88.0	61.0
Proportion of cattle custom fed	do.	65.0	68.0	70.0	41.0

-- = Less than 0.5 percent.

<sup>1/</sup> Combined capacity presented for firms with more than one feedlot.

Source: (32).

Development of custom feeding activities closely paralleled the growth and development of large feedlot operations (6). Capital requirements and risks associated with the operation of large feedlots are so high that traditional means of financing agricultural production have been inadequate to support the new system. At current price levels, the total financing of 30,000 cattle on feed can exceed \$15 million. Custom feeding is a means of providing the large-scale financing needed for the new feedlots.

About 53 percent of the cattle marketed from incorporated feedlots with a capacity of 2,000 or more head were custom fed in 1974 (32). This proportion was equal to about a fourth of all fed cattle marketed in 1974. Taking into account custom feeding at nonincorporated feedlots would raise the share to 30 to 35 percent, largely unchanged from a decade earlier (20). Since fed-cattle marketings in 1974 were 41 percent greater than in 1964, the number custom fed increased by about 2 million during the decade.

Clients who have cattle custom fed must, of course, assume the financial risks involved, which are high compared to other agricultural enterprises. Financial institutions will loan as much as 70 to 80 percent of the total costs, which at current prices is as much as \$550 per head. The client may need to provide only \$125, with the remainder provided by a commercial bank or other lender.

A 1974 study identified the legal form of organization of custom feeding clients in the Southern Plains as 38 percent sole proprietors, 31 percent partnerships, 21 percent corporations, and 10 percent cattle-feeding clubs and limited partnerships (7). The primary occupations of custom feeding clients, in terms of the proportion of cattle fed, were identified as 30 percent professional feeders, 28 percent farmers and ranchers, 16 percent livestock dealers, and 26 percent such other occupations as bankers, retailers, doctors, lawyers, teachers, and meat packers (7).

### Vertical Integration

Many of the large feedlots (2,000 head and over) are involved in parts of the beef industry other than feeding. It is doubtful that any one feedlot operation is involved in every stage of production and distribution, but it is fairly common to be in at least two different stages. The other functions include cattle production, transportation, packing, retailing, and food service.

Many large feedlots have vertically integrated with grain elevators and feed manufacturers to achieve feed economies. This is a logical development because feed accounts for a high proportion of the total cost of producing fat cattle and for which any savings would offer a significant competitive advantage. Most large commercial feedlots have not undertaken ownership of land or other resources required to raise cattle or produce the grain for feed because of the large capital requirements.

### Factors Causing Structural Changes in Cattle Feeding

A number of factors have influenced the changes in cattle feeding. These include the Government farm commodity programs, strong demand for beef coupled with rising consumer incomes, technical developments in grain production, and the exploitation of economic opportunity by a new breed of agricultural entrepreneur.

### Strong Demand for Beef

When assessing the forces behind structural changes, it is important to understand that a strong increase in the demand for fed beef occurred during the time that large commercial feedlot operations developed. The strong demand was partly

responsible for relatively high fed-beef prices. Per capita consumption of beef increased by about 51 pounds in only two decades, from 63 pounds in 1950 to 114 pounds in 1970. This can be attributed to an increase in nominal per capita disposable income from \$1,400 to about \$3,300 in the early seventies. Consumers have historically increased the proportion of beef in their diet as income levels increase. In addition, population increased from about 151 million in 1950 to more than 200 million in 1970 (34). The increase in consumption of beef between 1950 and 1970 was equal to about 140 percent of the total production in 1950. This increase in beef production was facilitated by the growth and development of cattle feeding.

### Feed Grain Supplies

The strong demand for beef influenced cattle feeders to utilize the farmers' tremendous capacity to produce feed grains. Feed grain production increased from 113 million tons in 1950 to more than 200 million tons in 1974. Government feed grain programs were in effect during much of this time and large quantities of feed grains were under loan or owned by the Government, with production exceeding the needs of livestock producers. The resulting low and stable feed grain prices encouraged the growth of cattle feeding. Utilization of corn and sorghum in cattle feeding increased from 11 million tons in 1960 to about 37 million tons in 1972.

### Feeder Cattle Supply

The increase in feeding could not have occurred so rapidly without an adequate supply of feeder cattle. The cattle herd, and thus the calf supply, increased by one-third during the sixties. But the large proportion of calves formerly slaughtered as nonfed beef provided the major source of new feeder stock for the feedlots. The proportion of the calf crop slaughtered as nonfed beef decreased from 21 percent in 1960 to 5 percent in the early seventies.

Forage supplies for cattle also increased as acreage formerly devoted to cotton and grain shifted into forage. Much of this adjustment was due to the movement of cotton production out of the Southeast. More than 50 million acres of cropland shifted to conservation practices, much in forage, as a result of the Government cropland diversion and conservation program in the fifties and sixties. The productivity of the acreage diverted from crops to forage was high compared to other land in forage. Even though there were regulations limiting the use of diverted acres, grazing was allowed except during a 5-month growing period. As a result, farmers and ranchers planted their diverted acreage in crops for winter and early spring grazing.

A different situation exists, today. The reservoir of cattle available for feeding but slaughtered as nonfed beef was virtually depleted by 1973. The acreage and conservation reserve programs were not in effect from the early seventies through 1977, and high grain prices caused many farmers to shift acreage from forage to grain production. Later, a sharp drop in feeder cattle prices led to a liquidation of cattle herds which are only now beginning to be rebuilt.

### Advantages of Large-Scale Feeding

The development of new technology--the large commercial feedlot--was another important factor influencing structural changes in cattle feeding. There are efficiencies in feeding cattle in large feedlots, at least up to 40,000-head capacity (5, 9, 12). In addition to these technical efficiencies, economies of size in buying inputs and selling fat stock, in the acquisition of information and capital, and in developing risk diversion strategies may offer additional competitive edges to large units. The existence of substantial scale economies permitting commercial feedlots to produce at a lower average cost per unit than smaller producers has contributed to the decline in the number of feedlots and may lead to even further concentration.

Large feedlot owners and their custom feeding clients may also be able to prosper with relatively low feeding margins per head because of the large volume of operation. Their use of highly leveraged capital may mean that a net margin of \$4 to \$5 a head will provide an 8- to 10-percent annualized return on their invested capital.

Custom feeding has helped the large feedlots achieve economies of size without assuming unacceptable levels of risk. Most of the risks are shifted from the feedlot owners to the custom feeding client. The feedlots remain able to feed their own cattle efficiently, even if limited in number, since custom feeding gives them the necessary volume to spread costs. Small feedlots cannot justify the additional recordkeeping, the expense of dealing with the custom feeding clients or their banks, and other matters.

Large feedlots have also been able to cooperate, or informally integrate, with packing plants located adjacent to their feeding areas. Such arrangements with meatpackers apparently have reduced the cattle assembly costs and production scheduling problems of beef processing plants. Thus, decentralization of the meatpacking industry, allowing new and more efficient plants to be located near concentrations of feedlots, has played an important role in the relocation of cattle feeding.

Growth of large feedlots has also been abetted by provisions in the tax laws which make feeding attractive. Recent changes in the tax laws limit former tax advantages for agricultural limited partnerships and syndicated custom feeding operations, but there are still income tax management strategies that can be followed when feeding cattle that can benefit custom feeding clients. Tax regulations permitting farmers to use cash accounting (rather than capital accounting) for tax computation are used to advantage by cattle feeders, including custom feeders, many of whom are seeking tax shifts for high nonfarm incomes.

### Growth of Cattle Feeding in the Southern Plains

Commercial cattle feeding in the Southern Plains grew rapidly as a result of several influences during the fifties and sixties. These included: (1) rapid increases in feed-grain production as a result of technological developments and the Government's production control programs, (2) development of new ways to finance agricultural production and spread the risks involved with large operations, including utilizing the equity of a second party (custom feeding), and (3) importation of new types of management abilities to operate the large industrialized feedlots. These influences were also felt in areas other than the Southern Plains, but to a lesser extent.

Feed grain production in the Southern Plains increased significantly as a result of a shift from cotton and wheat production to hybrid grain sorghum. Grain sorghum was considered a minor feed grain crop in the midfifties, and the acreage controls did not apply to it. The Government feed grain program did, however, provide an indirect price support which encouraged sorghum production. The planted acreage of sorghum in 1954 increased by about 2 million acres in Texas alone, a result of decreased cotton production caused by acreage restrictions. Grain sorghum, with similar climatic, cultivation, and mechanization requirements as cotton, was a natural alternative to cotton; in many cases it was the only one.

The introduction of hybrid grain sorghum shortly after the cotton acreage program was initiated further accelerated the shift (table 22). The hybrid development made it economical to develop new irrigation systems solely for sorghum production. Farmers also intensified use of such inputs as fertilizer and adapted other yield-increasing practices. The result was a substantial increase in the production of

Table 22--Grain sorghum production and cattle marketed from feedlots  
in Texas, 1951-73

Year	Grain sorghum production	Marketings from feedlots	Year	Grain sorghum production	Marketings from feedlots
	1,000 bushels	1,000 head		1,000 bushels	1,000 head
1951	74,193	NA	1963	242,660	896
1952	54,264	NA	1964	215,648	971
1953	56,837	NA	1965	294,056	1,094
1954	1/135,630	NA	1966	311,696	1,412
1955	148,309	227	1967	343,485	1,669
1956	124,202	307	1968	340,780	1,970
1957	2/244,075	291	1969	309,800	2,706
1958	251,427	296	1970	329,616	3,138
1959	257,832	403	1971	303,004	3,663
1960	258,552	477	1972	391,780	4,308
1961	229,635	548	1973	417,000	4,412
1962	201,006	756			

NA = Not available.

1/ Sorghum plantings increased by 2,029,000 acres in 1954 as cotton acreage decreased 2,400,000 acres because of acreage allotments.

2/ The first sorghum hybrids were available to farmers in 1957.

Source: (27).

sorghum in a period in which there was a concentrated effort through the feed-grain program to curb production. Texas sorghum production increased by 287 million bushels in 1953-68.

A second important factor in the development of large feedlots in the Southern Plains was the emergence of entrepreneurs skilled in the utilization of outside equity capital to operate the feedlots and spread the large financial risks. This was done mainly through custom feeding in the large feedlots for many types of clients. The custom feeders brought capital from people who otherwise would not have invested in agriculture. Commercial banks, particularly the large metropolitan banks in the Southern Plains, worked diligently with feedlot managers to develop procedures to finance both the feedlots and their custom-feeding clients. The shortrun nature of the production of fat cattle and the increasing value of cattle used as loan

collateral made cattle feeding loans an attractive alternative for bank loans. Later, new types of capital raising activities evolved, including debentures, public stock offerings, banker acceptances, and limited partnership arrangements, for financing cattle feeding and custom feeding clients.

The third important factor involved in the structural change, the importation of management, is difficult to measure. Many feedlot managers were brought into the High Plains from California, the Corn Belt, and other areas. Many of these managers had previous cattle feeding experience. However, the management of these large feedlots represents much more than just the feeding of cattle and goes far beyond the usual type of management in traditional farming. This management involves organization and direction of people, capital, machines and equipment, feed formulas, recordkeeping, the analysis of these records and other data, time and motion studies, experimentation, and working with consultants. Managerial abilities required to operate these large feedlots more nearly approximate those found in the industrial sector than the traditional agricultural sector.

Additional factors likely contributed to the development of the large feedlot industry in the Southern Plains, but simply delineating these factors misses the most important point. What is important to understand is that it was the convergence of several seemingly unrelated phenomena--including Government commodity programs, development of hybrid sorghums (growing out of tax-supported research), strong demand for beef and high consumer incomes, Federal tax policies, and new approaches to management and finance--that brought about major structural change. This observation suggests that if the potential costs and benefits of public policies and programs are to be fully understood, a much better job must be done of tracing through the secondary and tertiary impacts of those programs and their interactions with other phenomena.

The story of structural change in the Southern Plains cattle-feeding industry may not end here. Water tables are declining in the Southern and Central Plains, reducing the acreage where irrigation is feasible and increasing energy requirements to pump water. Energy costs are rising rapidly, impacting heavily on energy-intensive irrigated crops such as grain sorghum. If the declining water supplies and rapidly rising energy costs curtail crop production in the Southern Plains, what will be the impact on the feedlot industry located there? Will it relocate? Will shipments of grain from the Corn Belt increase? Answers are not available, but the questions are important and will be the subject of further research.

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